Antiseptic Therapeutics.

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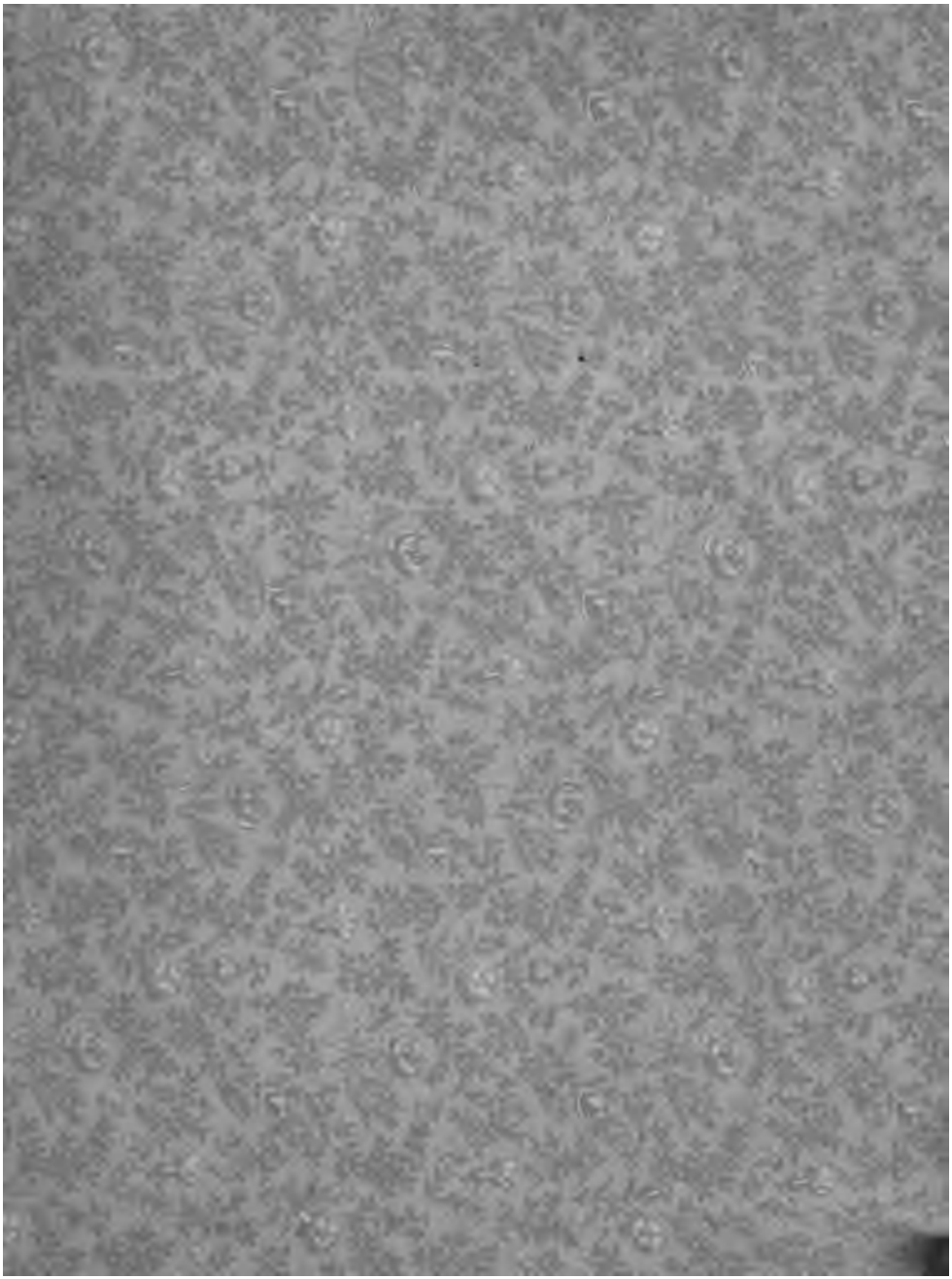

ANTISEPTIC THERAPEUTICS.

BY

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ANTISEPTIC THERAPEUTICS.

PART II.

ANTISEPTIC TREATMENT OF DISEASES WHICH BELONG TO INTERNAL PATHOLOGY.

PLAN AND DIVISION.

In this Second Part it is my intention to indicate, in connection with the consideration of each disease in particular, the methods of treatment and formulæ which belong to the antiseptic therapeutics of these diseases. Passing lightly over therapeutic procedures to-day abandoned, or which seem to give only uncertain results, I shall attempt to give the methods that yield the best results, and particularly such as are preferred by our best authorities in the hospitals of Paris and actually employed in their daily practice.

I hardly need say that the antiseptic treatment should be supplemented, according to the indications, by eusthenic or hypnotic remedies, conformably to the division of medicaments into three great classes which I have previously indicated. As a general rule, I shall consider here only the antiseptic treatment properly so-called.

I shall study the diseases in the following order:

1. Respiratory apparatus (mouth, pharynx, larynx, bronchial tubes, lungs, pleura).

2. Digestive apparatus (stomach, intestine, liver, peritoneum).

3. Circulatory apparatus (pericardium, endocardium, myocardium, blood-vessels).

4. Genito-urinary apparatus of man and of woman.

5. Locomotor apparatus and nervous system.

6. General diseases.

7. Diseases of the skin.

Although it does not enter into the plan of this work to treat of surgical antisepsis, I shall indicate briefly the principal antiseptic modes of treatment applicable to the following conditions:

8. Diseases of the eyes.

9. Diseases of the nose, throat, and ears.

10. Antisepsis in obstetrics and gynæcology.

CHAPTER I.

ANTISEPTIC TREATMENT OF DISEASES OF THE RESPIRATORY APPARATUS.

STOMATITES.

Stomatitis is generally considered as belonging to diseases of the digestive apparatus; but antisepsis of the mouth is of so great importance from the point of view of diseases of the respiratory apparatus (angina, laryngitis, bronchitis, pneumonia), and these are so often complicated with stomatitis, that it seems best to place the treatment of the latter at the very beginning of this study.

It is a fact that a great variety of microbes live in greater or less abundance in the mouths of individuals who enjoy the most perfect health.* In 1883, Rasmussen enumerated thirteen species in the saliva of healthy men; several (leptothrix, penicillium, mucor) are not true bacteria, but belong to the lower fungi. M. Vignal, in 1886, demonstrated for the first time pathogenic microbes, such as those of pus (*Staphylococcus pyogenes aureus*) and of pneumonia, etc. In a word, the saliva is liable to contain specimens of all the pathogenic microbes, from those of diphtheria to those of typhoid fever.†

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*Th. David: Les Microbes de la Bouche. Paris, 1890.

†See on this subject a résumé by M. Netter in the *Revue d'Hygiene*, 1889, p. 501.

To this list, already long, must be added the microbes of dental caries; for details concerning these and the diseases produced by them we must refer the reader to the monograph of M. David above indicated.

The prophylaxis of these conditions will be considered in Part III (Antiseptic Hygiene). Here we have to do only with the question of stomatitis properly so-called.

Concerning the etiological diagnosis of these stomatites, it is first of all important to know whether the saliva is acid or alkaline, because on this the indications for the choice of the antiseptic depend. Mixed saliva (formed by a mixture of the fluids furnished by the three pairs of glands) is normally *slightly alkaline.* When it remains long in the mouth, as is the case in most febrile diseases, or where the patient is badly nourished, the saliva may undergo ammoniacal decomposition. On the other hand, it becomes acid when it contains an excess of epithelial cells (Gautier).

Moreover, it is known that the lower fungi (*Saccharomyces albicans*) are developed in an acid medium; bacteria, on the contrary, or microbes properly so-called, can only thrive in an alkaline medium. The treatment should therefore be very different according as the stomatitis is caused by the thrush fungus or by bacteria. In the first case alkaline waters are indicated; in the second, acids are required.

It is always easy to test the alkalinity of the saliva by litmus paper, making a comparative experiment with saliva considered as normal. In case of doubt, microscopic examination of the saliva of the patient may be made.

Thrush (*Mugnet*).—Affection produced, as we have just seen, by the *Saccharomyces albicans*, and which is always accompanied by an abundant desquamation of epithelium. The saliva is acid.

Vichy water, which is slightly alkaline, suffices in mild cases, employed as a gargle and beverage. In grave cases, use for a collutorium a saturated solution of borax. G. Sée recommends the employment of boric acid, as in the following formula:

Boric acid..... 1 part.
Glycerin..... ..... 5 parts.

M. Paint the aphthous parts with this solution.

Boric acid is a very feeble acid, reddening litmus but very slightly. Its use in this affection is sanctioned by experience.

Vidal recommends Van Swieten's solution of corrosive sublimate applied with a camel's-hair pencil to the diseased parts. It is a very effective remedy.

In all cases of stomatitis, good results are obtained by irrigations every two hours with a solution of peroxide of hydrogen—a remedy which, as we shall see, is also used to advantage in diphtheria.

Stomatites Symptomatic of Grave Fevers.—In typhoid fever and other fevers of long duration,

accompanied by a fuliginous state of the mouth, gums and teeth, the following collutorium (*British Medical Journal*) will be beneficial:

Boric acid	1.00
Chlorate of potash	0.75
Lemon-juice	15.00
Glycerin	10.00

M.

Aphthous Stomatitis.—This affection is attributed to the agency of the same microbe that produces the *epizoötic aphthous fever* of the bovine species, a bacterium described under the name of *Streptococcus aphthicola*.

M. Hirtz, while admitting the microbian nature of the affection, has treated it by painting the mouth and throat every two hours with salicylate of soda in 20-per-cent. solution; the excessive pain of the ulcerous period being assuaged by interposing between the gingival and buccal mucous membranes little wads of absorbent cotton saturated with the following solution:

℞ Sod. salicyl	1	part.
Cocaini chloridi	2	parts.
Aquæ destil	100	parts.

Intestinal antisepsis is effected by the following preparation administered by mouth in cachets or capsules:

Salicyl. of bismuth Naphthol	āā 2 Gm.

M. Divide into four powders. Sig.: One powder to be taken every six hours.

Ulcero-Membranous Stomatitis. — M. Bergeron, who has shown that this affection is specific, endemic, and contagious, considers chlorate of potash the most effective remedy. This may be used in gargles or sprays, in saturated solution.

Jaccoud combines the chlorate of potash with a decoction of cinchona:

Chlorate of potash.....	6.0
Alcoholature of cochlearia.....	30.0
Syr. cinchona.....	60.0
Decoc. cinchona.....	250.0

M. For a gargle.

The application of dry chloride of lime, of sulphate of zinc (1 part to 20 of water), of sulphate of copper (1 part to 40), is recommended in rebellious cases by Henoch, and irrigations of permanganate of potash and salicylic acid in dilute solution are employed by the same authority when the affection takes on a necrotic form. In the simply ulcerous form, Comby recommends a solution of borax in honey of roses and glycerin for a collutorium:

℞	Borax (or potas. chlor.).....	1 part.
	Mel. rosae }	
	Glycerin } ää	5 parts.

Barié advises the following formula:

Salicyl. acid.....	1 part.
Glycerin.....	10 parts.

To paint the ulcerations.

Mercurial Stomatitis.—Suspend the mercurial

treatment and give chlorate of potash, or use the following dentifrice as an astringent antiseptic:

℞ Tannin 2.0
Alum..... 1.0
Spts. menth..... ..... q. s.
Pulv. catechu
Yellow cinch. bark } ää 15.0

In the severer cases, Ricord orders light brushings of the gums with hydrochloric acid in more or less dilute solution.

Finally, however paradoxical it may appear, corrosive sublimate as a mouth-wash succeeds very well, according to the following formula (of Rienzi Errico):

℞ Corrosive sublimate..... 0.25
Distilled water..... .. 1000.00

M. To be used as a collutorium during forty-eight hours.

The fetor of the breath disappears rapidly, and the inflammatory symptoms subside, so that a cure is effected in about five days.

GANGRENE OF THE MOUTH, OR NOMA.

This affection (caused by the *Streptococcus nomæ*, Trévisan, according to Cornil and Babes) must be treated by the most energetic antisepsis. Cauterization with the thermo-cautery, which destroys the microbian focus, is to-day preferred. A thick paste of camphor is spread over the sore. After the fall of the

eschar, Henoch applies a wad of cotton saturated with camphorated wine. Sulphoricinated naphthol may be employed. Irrigations with salicylic or thymic acid in aqueous solution are of service.

AMYGDALITES AND NON-DIPHTHERITIC ANGINAS.

The infectious and contagious microbian nature of amygdalitis (tonsillar angina) and of most of the simple anginas, is generally admitted. Alternations of weather, formerly considered as exclusive causes of these diseases, are probably only determining causes, influencing the microbes which exist in the mouth (or their germs) in the same way as the succession of the seasons acts on the seeds buried in the earth—that is to say, by giving them the stimulus which renews their activity, and by creating at the same time, in the organism, the *morbid opportunity*. The hygrometric condition of the air must have a great influence upon the development of the bacteria of the mouth and throat, for the sensibility of micro-organisms to variations of humidity has been long known.

We have noticed recently in Paris (February and March, 1892) that dry, cold, east winds, raising clouds of dust, were coincident with real epidemics of amygdalitis and of laryngitis, which were, on the whole, generally benign. The microbian nature of these affections does not exclude their cyclical evolution, which is ordinarily effected through the re-

sources of the organism alone. Nevertheless, a simple angina may become very rapidly and insidiously severe by a local extension of the parasite and of the inflammatory processes that it produces, when the antiseptic treatment has not been pursued from the onset.

The microbes, probably of multiple species, which may develop in amygdalitis have not yet been fully studied. In a case of phlegmonous amygdalitis, M. Bouchard found the pus coming from the abscess filled with an enormous quantity of short and thin bacilli. M. Hanot has noted the *Streptococcus septo-pyæmicus* (Biondi) in a severe angina complicated with purulent pleurisy.

In other cases the affection may rapidly take on the form of a general infection, with chills, intense fever, engorgement of the sub-maxillary glands, urine red, turbid and albuminous, pseudo-rheumatic arthropathies, etc., or be complicated with œdema of the throat.

Simple Amygdalitis.—For a simple amygdalitis, Bouchard prescribes the following gargle:

℞ Sodium borate 6.0
Tinct. benzoin..... 10.0
Infus. of blackberry root..... 250.0

Or:

Boric acid..... 2.0 to 4.0
Mulberry syrup..... 50.0
Distilled water..... 100.0

M. To use full strength for painting the throat, or mixed with equal parts of warm boiled water for a gargle every two hours.

Charles Eloy* has recommended the following formulæ. For the local treatment, apply the following with a swab:

℞ Salol..... 2.0
Alcohol.....q. s. to dissolve.
Glycerin..... 40.0

Or, better still, the sulphoricinate of salol, which stays on the affected parts longer:

℞ Salol ..... 5.0 to 10.0
Sulphoricinate of sodium..... 90.0

M. To be applied by means of a swab or camel's-hair pencil. (It has the consistence of a pomade.)

For a gargle, salicylic acid (1 part to 300 parts water), naphtholated water, creolinated water, may be used:

Commercial creolin } ää equal parts.
Warm water }

This is to be applied with a swab, and followed by a gargle of warm water to relieve the burning sensation produced by the creolin.

For irrigation, salol-water made when required by adding to a litre of warm boiled water the following solution:

℞ Salol..... 1.0
Alcohol..... ..... 50.0

Salol, which is but little toxic, suits children well.

**Revue de Clinique et de Thérapeutique, et Moniteur Thérapeutique*, Jan. 4, 1892, p. 3 *et seq.*

M. Leon David* has prescribed lately, in the treatment of various forms of angina, *microcidine* (*naphtholate of soda*), which is very slightly toxic, and has the advantage over most of the preceding applications of being soluble in water without the addition of alcohol (solution of 8 parts to 1000, which may be weakened by the addition of warm water; when required, solutions much stronger may be used, as 3 parts to 1000).

Painting the throat with tincture of iodine, or with glycerin and iodine, is less painful, and may be indicated to cut short the disease.

IODIZED GLYCERIN.

℞ Iodine..... 0.25 to 0.50
Potas. iodide..... 3.00
Glycerin..... 25.00 to 30.00

M. If the application is painful, it may be diluted by doubling the quantity of glycerin.

For general treatment, M. Gougenheim gives *salol* (2 to 4 grammes in four to eight capsules), to be taken during the day as calmative and febrifuge. M. Dubousquet Laborderie prescribes quinine and resorcin; M. Bouchard, *naphthol* as a general antiseptic. In severe cases a treatment similar to that of diphtheria may be carried out.

Herpetic Amygdalitis.—This affection should be

* Thèse, 1892, and *Journal de Médecine et de Chirurgie Pratiques*, 1832, p. 264.

considered as no less infectious than the above, and the antiseptic treatment is the more necessary since tonsillar abscess is sometimes a complication.

PSEUDO-MEMBRANOUS DIPHTHEROID ANGINAS.—These anginas, which only differ from diphtheritic anginas by their relative benignity, have been considered as attenuated forms of diphtheria. It is more probable that they are due to a different microbe, which causes the formation of false membranes similar in appearance to the true diphtheritic exudate. The less virulent nature of the toxines secreted explains the relative benignity of these affections, but the local antiseptic treatment of diphtheritic angina should be applied with equal care, particularly in the case of children, where the local symptoms have so great importance.

One of these anginas, at least (*Pneumococcus angina*), has been studied quite thoroughly.

ANGINAS DUE TO THE PNEUMOCOCCUS.—We use the plural of angina because, according to M. Netter, the *Klebsiella salivaris* Trévisan, or Talamon-Fränkel microbe, designated by the common name of pneumococcus,* and considered as the specific microbe of fibrinous pneumonia, may produce the four following forms of angina: (1) Suppurative amygdalitis; (2) Pseudo-membranous angina; (3) Follicular amygdalitis; (4) Simple and herpetic angina.†

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* In French we use the word *Pneumococcus* or the systematic name of *Klebsiella salivaris*.

† *Semaine Médicale*, May 13, 1891, p. 195.

Pseudo-membranous angina due to the pneumococcus is the most important, because of its clinical resemblance to diphtheritic angina, and because of its gravity, especially in children. It was described by Jaccoud in 1891. The false membranes contain only the pneumococcus, with no mixture of Löffler's bacillus. In a case observed by M. Netter in a child of three years, the extension of the false membranes to the larynx necessitated tracheotomy.

I have myself observed a severe angina of this nature in a child of seven years who had had pneumonia *three months* before.

The antiseptic treatment is like that of diphtheria: the applications with camphorated or sulphoricinated naphthol, etc., and especially the irrigations with boric water renewed every two hours, give excellent results.

The fact that these anginas often succeed pneumonia indicates the necessity of careful antisepsis of the mouth during the duration of the latter disease and for a long time after.

DIPHTHERITIC ANGINA: CROUP.

This affection, caused, as is known, by Löffler's bacillus (*Pacinia Löffleri*, Trévisan), and designated under the name of croup when the false membranes are propagated to the larynx, derives its gravity from the obstruction caused by the exudate in the air-passages, especially in young children who have the

larynx and trachea very narrow; the empoisonment of the blood by the toxines proper to this microbian species is also an important factor of gravity.

It is, then, necessary to act from the very onset by a local energetic treatment to destroy in the pharynx the false membranes which contain the specific bacillus, the treatment having much fewer chances of success when the affection is propagated to the trachea or there are symptoms of general poisoning.

Mercurials always occupy the front rank among antiseptics designed to combat the gravest maladies. Corrosve sublimate administered internally and locally, and calomel, are still prescribed by English and American physicians. Frictions of mercurial ointment over the neck, to the point of salivation, have been also employed. Cyanide of mercury has been vaunted by Erichsen, Annuschet, and more recently by Ruelle, who gives the following formula:

Cyanide of mercury.....	0.05
Alcohol.....	8.00
Distilled water.....	192.00

M. Dose, a teaspoonful every hour, before the disease becomes generalized.

But these very active medicaments are but little used in France, by reason of their toxic action, which is to be dreaded in children.

Iodoform in solution in ether or tolu balsam may be painted over the diphtheritic patches, or insufflations of iodoform powder mixed with sugar may be employed.

Iodide of potassium has been prescribed for internal use in a 2- to 4-per-cent. solution in water, by Stepp; dose, one or two teaspoonfuls every hour. [This treatment can surely do no good.]

Bromine, under the form of bromine water, has been advised by Ozanam.

M. Sevestre prescribes:

Bromine	gtt. iv.
Bromide of potassium	0.50 Gm.
Syrup	30.00
Distilled water	125.00

M. Sig.: A teaspoonful every hour.

It would be advantageous to use bromoform, and especially bromol, of which I have already spoken (see Part I). Bromol dissolved in glycerin (1 part to 25) may be used as a local application to the false membranes, in the place of iodine and iodoform.

Sulphur has been employed in insufflations (the dried powder being blown upon the diseased parts). This is a favorite mode of treatment with Liebermeister. Barboza applies sulphur in emulsion in oil of sweet almonds. Sulphide-of-calcium pills (⅛ grain every hour) are also prescribed by the same authority. The calcium sulphide is decomposed, and H_2S is set free and impregnates the breath.

In nasal diphtheria, Jules Simon prescribes the application of sulphur ointment, 1 part sulphur to 8 of lard.

The perchloride of iron has long had a great

reputation in diphtheria; it is used internally, and locally in paintings or swabbings of the throat. The patches in the mouth or throat are brushed two to four times a day with a solution of perchloride of iron and glycerin, of each equal parts. [The tincture of the perchloride is given internally in the dose of five to ten drops every two hours.]

Boric acid in concentrated solution (2- to 4-per-cent.), in glycerin and water or in plain water, is very much employed in irrigations by reason of its absolute innocuousness. It is preferred to lime-water, formerly employed for purposes of irrigation.

Forain extols chloride of zinc in saturated solution, mixed with about an equal amount by weight of powdered cinchona bark, and the whole made up into a paste of the consistence of jelly by stirring in strained honey. This mixture is brushed over the false membranes every two to four hours. He claims that the application is attended with little pain, and that if used from the onset it arrests the development of the disease.

The antiseptics borrowed from organic chemistry are generally preferred to-day in France in the local treatment of diphtheria. Lactic and oxalic acids, chloral, carbolic acid associated or not with camphor, copaiba, resorcin, salicylic acid, creasote, naphtha, etc., have all in turn been tried.

Jules Simon, an excellent hospital authority,

employs salicylic acid according to the following formula:

Acid, salicylic	1.00
Alcohol	q. s. to dissolve.
Glycerin	0.40
Infus. eucalyptus	0.60

M.

(It will be seen that the above is a very concentrated solution of salicylic acid.) To be applied to the diphtheritic patches by means of a swab consisting of a stick armed with absorbent cotton; should be brushed over the parts with considerable force (but *not to cause lesions*) every hour during the day, and three times during the night.

Simon also uses lemon-juice and dilute acetic acid in the same manner, sometimes alternating them with the salicylic acid.

Bergeron employs a weaker solution of salicylic acid, as follows:

Acid, salicylic	1 part.
Glycerin	30 parts.

Phenol and camphorated naphthol, which have rendered good service in the past, have been of late rather set aside for sulphoricinated phenol and naphthol. The first-mentioned topical agents are open to the objection of being somewhat painful when employed in rather concentrated solution. Gaucher,

nevertheless, still employs the following mixture, claiming for its use the most satisfactory results:

℞ Camphor..... 20 parts.
Castor oil..... 15 parts.
Alcohol..... 10 parts.
Phenic acid (concentrated)..... 5 parts.
Tartaric acid..... 1 part.
M.

His method of applying this remedy is as follows: A swab is made by wrapping a wad of absorbent cotton around the end of a pair of long dressing-forceps; this is dipped into the mixture and brushed freely over the diphtheritic patches. To remove the false membranes half detached, Gaucher uses the swan-skin brushes of M. de Crésantigues.

In the preceding formula naphthol may be substituted for the phenic acid in the same proportion; the camphorated naphthol may also be employed (1 part to 2 of camphor, dissolved in glycerin), the back part of the throat having been previously painted with a 2-per-cent. solution of cocaine.

Comby prescribes the following formula:

℞ Naphthol..... 1 part.
Camphor..... 2 parts.
Glycerin..... 3 parts.

M. To be applied with sufficient thoroughness three times a day by meaus of an ordinary swab.

To this treatment he adds sprays, for five to ten minutes at a time, of boric solution 4-per-cent., or a salicylic solution 2-per-cent.

Phenol and sulphoricinated naphthol are the two antiseptics which seem to have been preferred for cauterization of the diphtheritic membranes, because of their relative innocuousness, and chiefly because their application is comparatively painless, which is a consideration in treating children.

Sulphoricinated phenol, or Yvon's sulphoricinate of orthophenol, is used by MM. Grancher, Hutinel, Sevestre, d'Heilly, Legroux, and others, according to the following formula, more or less modified:

℞ Sulphoricinate of soda..... 70 parts.
Phenic acid (pure)..... 30 parts.

M. Dissolve while cold, shaking it.

Even without the water this mixture is not caustic; the proportion of phenol may be increased to 40 per cent. Use the forceps—swab, the points being covered with antiseptic cotton. The mucous membrane becomes pale under this application; it is well to be forewarned of this fact, in order not to confound this condition with a false membrane.

If naphthol be preferred, the following formula may be used:

℞ Sulphoricinate of soda..... 90 parts.
Naphthol β..... 10 parts.

Mix cold or slightly warm.

Salol and creasote can be used equally well as excipients of the sulphoricinate of soda. M. Munk uses creolin, which has the advantage of being soluble in water (1 to 2 per cent.).

Creasote with rum or with glycerin is given internally by M. Legroux, in the secondary affections (bronchitis and broncho-pneumonia) which may complicate diphtheritic angina. To this is added the hydrochloric lemonade (4 to 1000) in order to lessen the action of the toxines secreted by the diphtheritic microbe.

M. Sevestre, in addition to the local treatment, performs intestinal and general antisepsis by giving betol, or rather benzonaphthol.* Moreover, the benzoate of soda (two to five grammes a day as a potion) is given to insure the working of the kidneys, which is all-important in eliminating the poisons.†

Critical Appreciation.—Among the numerous formulæ above reviewed, a choice must be made. This is a plan that may be safely followed:

1. To cauterize the false membranes, choose phenol or sulphoricinated naphthol. In applying these remedies great care must be taken to avoid abrading the subjacent mucosa.

2. Irrigations have even as great an importance as cauterizations. They should be more frequent (every two hours); on them we depend for the detachment of the false membranes. The liquid with which the irrigations are made is of less importance: boiled water, boric water, lime-water, peroxide of hydrogen,

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* Betol is the salicylate of naphthol. Benzonaphthol is the benzoate of naphthol.

† *Sem. Méd.*, Dec. 2, 1891, p. 230.

salicylated water (1 part to 1000), chloral water (1 per cent.), generally warm, may be used with equal success. These irrigations may be made less frequently during the night, out of regard to the patient's sleep; the respiratory bruit is a sufficient guide—if this becomes noisy and stertorous, an irrigation will make the breathing more easy for an hour or two.

If there are false membranes in the nares, they should also be irrigated. Where the physician cannot always be present, and where there are rebellious children, as frequently happens, the parents should be made to understand the usefulness—even the absolute necessity—of the irrigations and of their frequent renewal. The kind of irrigator matters little; a simple hand-ball rubber syringe or a fountain syringe will answer the purpose, provided a sufficient jet is obtained. If necessary, and if the child refuses to open his mouth, a wedge may be placed between his teeth. It is superfluous to add that all the instruments should be made perfectly aseptic (the cannula of the irrigator should remain in a solution of sublimate, 1 to 1000, all the time it is not being used). If there is any danger of extension to the larynx, the irrigating substances may be used as sprays.

3. To make the atmosphere of the room aseptic, creasote may be used in spray and in evaporating solutions, or solutions of thymol and the essence of eucalyptus, of tar, and of other essences, may be employed in the same way.

4. Intestinal and general antisepsis may be obtained by means of betol or benzonaphthol, and if necessary, inhalations of oxygen, independently of the ventilation of the room—which should be kept at 16° or 17° C. (60° to 65° F.) The patient should be fed as much as his appetite will permit, and his strength should be kept up with tonics (wine of cinchona, etc.). Finally, the renal and circulatory functions should be regulated with benzoate of soda and with caffeine.

LARYNGITIS.

The antiseptic treatment of laryngitis has made very little progress because of the difficulty of applying local treatment. Sprays of antiseptic liquids do not reach the seat of disease completely in croup or in the other laryngeal infectious diseases.

In typhoid laryngitis, M. Renaut has used with success corrosive sublimate (Van Swieten's solution) sprayed into the wide-open mouth for ten minutes, three or four times a day. Recovery ensued in five or six days.

In tuberculous laryngitis, M. Ruault has had good success with sprays charged with the vapors of phenic acid or resorcin. Carbolic sprays of 1 to 2 : 100 act slowly, but are better borne than sprays of greater strength. Solutions of resorcin in doses varying with the gravity of the disease, do not provoke any irritation, but on the other hand produce a notable amelioration.

Creasote dissolved in oil is used for swabbing by MM. Cadier and Ruault.

Rosenberg uses an oily solution of menthol which is both anæsthetic and antiseptic.

Sprays and inhalations of sulphurous waters are very useful in tuberculous and syphilitic laryngites. In the latter case, M. Ruault uses nitrate of silver, 5 to 10 per cent., which is well borne.

Most of the antiseptics that we have named as applicable in the treatment of angina may be employed as sprays in laryngitis.

M. Tissier gives the following indications for the antiseptic treatment of chronic laryngites (non-tuberculous) with or without curetting:

In epithelial lesions, camphorated naphthol gives the best results, used according to the following well known formula:

℞ Naphthol *β*..... 1 part.
Camphor..... 2 parts.
Mix and triturate together.

This is applied by means of a laryngeal probe covered with cotton, with the help of a laryngeal mirror—the cotton tampon should be sufficiently large to brush over the entire mucous membrane. It provokes a slightly smarting sensation, which however is not painful. These applications should be renewed twice each week. Towards the end a solution of zinc chloride, 1 part to 10, may be substituted.

Camphorated salol is less efficacious than naphthol, but is indicated sometimes in subacute laryngitis:

℞ Salol..... 3.0
Camphor..... 2.0

Triturate and filter the liquid mixture.

In the most severe cases, scraping or curetting the diseased tissues is of use.

I think that sulphoricinated naphthol might be used here in place of camphorated naphthol.

Internally, especially in the treatment of croup, the good effects of benzoate of soda are marked. Its uses in the treatment of bronchitis we shall study in the proper place.

BRONCHITIS.

In the bronchial secretions of patients suffering from bronchitis, numerous species of bacteria are generally found, presenting themselves almost always under the form of *microbian associations;* that is to say, it is difficult to decide if the morbid process has been provoked by one more than another. The kinds most frequently found are: *Streptococcus pyogenes, Staphylococcus aureus, Klebsiella Friedländeri, Protei,* and mycogenous bacteria of which little is yet known, etc. The streptococci, notably, penetrate quite deeply into the folds of the connective tissue of the bronchi affected with necrobiosis, the protective epithelium of which is desquamated; this tissue is infil-

trated with leucocytes (phagocytes). In chronic bronchitis the epithelium is often preserved, but modified (Cornil and Babes).

The greater part of the medicaments employed as *expectorants* or *modifiers* of the bronchial secretions are, at the same time, antiseptics. Such are the balsams of Tolu and of Peru, terpine, terpinol, terebinthine, creasote, eucalyptus, iodine and iodides, etc.

M. Ruault recommends very highly benzoate of soda in all forms of bronchitis, from coryza and colds to catarrhal bronchitis, acute and chronic. Below are his conclusions:

1. The benzoate of soda appears to have an elective action upon the mucous membranes of the upper passages, similar to that which other balsams, such as terpine, have upon the mucous membranes of the bronchi, and as terebinth and the balsam of copaiba have upon the mucous membranes of the urinary passages.

2. Its use is indicated preëminently in common cold, coryza, the simple anginas, and in congestive attacks allied to granular pharyngitis.

3. It must be used in the adult in doses *per diem* of from four to five grammes at least, often six to eight grammes, given during six to twelve consecutive days.

4. The physician will avoid the prolonged use of this medicament, without intervals of suspension, in order to prevent digestive troubles, especially in dyspeptics.

At the onset of a coryza or a simple cold, M. Ruault gives three or four times per day a soupspoonful of the following syrup in a cup of an infusion of pine-buds:

Benzoate of soda*.....	40.0
Dissolved in:	
Water.....	80.0
Add:	
Syrup of bitter orange peel.....	280.0

Shake.

Under the influence of this treatment recovery frequently follows in three to five days.

Terpine is often prescribed as a modifier of the bronchial secretions. Below is the formula given by M. Dujardin-Beaumetz:

POTION.

Terpine.....	0.50
Syrup of catechu.....	30.00
Alcohol.....	30.00
Water.....	100.00

(To be taken in tablespoonful doses during the day.)

Or, if preferred, terpine and benzoate of soda may be combined, as in the following formula:

POTION.

Terpine.....	0.50
Benzoate of soda.....	1.00 to 3.00
Syrup of Tolu, Syrup of acacia ää.....	25.00
Distilled water.....	100.00

(Dose, a tablespoonful every hour.)

*The benzoate should be prepared with benzoic acid extracted from benzoin.

(In this potion terpine is simply in suspension in the liquid.)

Terpinol is prescribed generally in capsules of 10 centigrammes, or in pills as in the following formula:

Terpinol Benzoate of soda	} ää	0.10
Sugar		q. s.

(For one pill. Take from six to twelve per day.)

Turpentine and creasote are used in potions or in capsules, and are especially efficacious in catarrhal and chronic bronchites.

M. Dujardin-Beaumetz prescribes the following wine:

Beechwood creasote	3.00
Alcohol	100.00
Wine of Bagnols	300.00
Simple syrup	100.00

(To be taken in spoonful doses.)

Or, again, the mixture:

Vegetable creasote	3.00
Neutral glycerin	400.00

(Take one to two tablespoonfuls, morning and night, in a glass of water suitably sweetened.)

Capsules containing equal parts of creasote, turpentine, and balsam of Tolu, in such a manner that each capsule represents *one gramme* of the mixture, have given me good results in all cases where the bronchitis was unduly prolonged and tended to pass

from the acute to the chronic state. The muco-purulent secretion is rapidly dried up; moreover, these capsules taken at the moment of eating (four to six per day) are well supported by the stomach, and do not cause disagreeable eructations.

In *fetid bronchitis*, M. Lancereaux employs the hyposulphite of soda in doses of four to five grammes in a potion to be taken during the day. The favorable action is not evident before a week or more.

In *broncho-pneumonia* complicated with other diseases, especially in the child, M. Sevestre has obtained good results from calomel.

LA GRIPPE, OR INFLUENZA.

The bacillus of influenza, already noted and photographed by Cornil and Babes in 1890, has recently been described in a more complete manner by Pfeiffer and Canon (of Berlin). It is a very small, rod-shaped organism, often grouped in chains, end to end. Stained by methylene blue, it has the appearance of a diplococcus, as is seen in the photographs of Babes,* and its method of grouping end to end has caused it often to be mistaken for a streptococcus (whence the name of *Streptococcus Seiferti*, given by Trévisan to this bacterium). This micro-organism should be classed in the group *Bacillus*, and placed near the

* Cornil and Babes, "Les Bacteries," 3d ed., t. ii, pl. iv, fig. 6.

Bacillus insidiosus (Trévisan) or the *Bacillus murisepticus* (Fluegge), under the name of *Bacillus Seiferti.*

A great number of antiseptic treatments have been proposed to combat this affection, and it may be said that all the substances in the arsenal of therapeutics have been tried in turn.

Sulphate of quinine, antipyrine, the acetate and muriate of ammonia, salol, betol, exalgin, acetanilid, phenacetin, naphthol, etc., are the principal medicaments used.

M. Dujardin-Beaumetz employs, according to the indications, in the nervous form, antipyrine (cephalalgia) or exalgin (rachialgia).

Antipyrine is administered in some alcoholic potion or in tea (two to three grammes per day).

Exalgin is given in the following potion:

Exalgin	2.50
Spirits of mint	10.00
Dill-water	120.00
Syrup of orange flowers	30.00

(A soupspoonful, morning and evening.)

Phenacetin is given in capsules containing one gramme, morning and evening (it is less active than exalgin).

In the catarrhal form, the same authority prescribes:

Muriate of quinine	0.25
Antipyrine	1.00

(For one capsule. Give two per day, one morning and evening.)

The strength of the patient may be sustained by the use of hypodermatic injections of caffeine dissolved in boiled water to which benzoate of soda has been added (2 grammes of each to 6 grammes of water).

English physicians have recommended a potion composed as follows:

Salicylic acid		7.50
Ammonium carb., q.s. to neutralize.		
Glycerin		30.00
Bromide of ammonium Muriate of ammonium Benzoate of ammonium	ää	7.50
Liq. ammoniæ acetatis		60.00
Peppermint water	q.s. to make	180.00

(To be taken by soupspoonfuls every two hours in warm milk or water till defervescence takes place.)

Benzol is recommended by M. W. Robertson (of Newcastle-on-Tyne).

In grave cases intestinal and general antisepsis must be sought by aid of naphthol, betol, or benzonapthol.

WHOOPING-COUGH.

Although the contagious and infectious nature of this affection is generally admitted, the microbe which produces it, probably the bacillus discovered by Affanassjew in 1887 (*Bacillus Affanassieffi*, Trévisan; *B. tussis convulsivæ*, Affanassjew), has not yet been sufficiently studied.

Phenic acid has been recommended from the first for this disease. Ortille places before the mouth, at the moment of the sibilant inspiration which follows the paroxsyms, a wide-mouthed bottle containing a phenic solution. A plate filled with a mixture of phenic acid, petroleum, and benzoin is placed in the sick-room.

Sprays have also been used with a 2-per-cent. phenic solution, three times per day, the cannula being kept at a distance of about three inches from the mouth (Gerhardt and Burchardt). The strength of the solution has even been increased to 4 and 5 per cent. (Goldschmit), in the endeavor to keep the patient in an atmosphere strongly charged with carbolic acid.

Phenic acid has also been introduced by the alimentary canal (Oltramare):

POTION.

Phenic acid	1.0
Syrup of mint	40.0
Water	80.0

Petroleum, in inhalations from plates, is advised by Hildebrandt.

The muriate, the tannate, and the sulphate of quinine in insufflations or sprays, sometimes associated with ammonium carbonate, have been tried by various physicians.

Benzoate of soda in potion (6 grammes) has been given as in croup (Tordeus).

Thymol is employed by M. Poulet and M. Bouchut, who use the following mixture by evaporation:

Thymol	10.0
Alcohol	250.0
Water	750.0

Salicylic acid, the salicylate of soda, and resorcin have been used as topical agents, being applied as deeply as possible, and turpentine has been employed in inhalations and vaporizations.

Kolover has obtained some success in injecting to the base of the pharynx, a solution composed of:

Sulphate of quinine	4.0
Sulphuric acid	2.0
Distilled water	190.0

The patient's tongue is depressed, and he is made to pronounce the letter A while the liquid is injected by means of a syringe, at first every two hours, then every three hours when the paroxysms diminish in frequency.

Insufflations of powders into the nose have been employed by Michael (quinine, benzoin, boric and salicylic acids, iodoform, tannin, associated with more or less inert powders—sugar, talc, marble-dust, etc.).

M. Guerder uses finely-ground coffee thoroughly dried, and mixed with boric acid. M. Moizard employs the following powder:

Pulverized benzoin Salicylate of bismuth	} ää	5.0
Sulphate of quinine		1.0

three months, or sometimes only a few days, after the defervescence of the disease. It seems more logical, in every case, to admit a purely local vaccination. According to Tchistovitch, the favorable termination should be in proportion to the abundance of the pulmonary phagocytosis.

However this may be, the microbian nature of pneumonia being admitted, its antiseptic treatment is indicated in the most formal manner, not only at the period of suppuration, but from the onset of the disease. This treatment, however, has advanced very little, apart from the requirements of antiseptic hygiene which preoccupy the physician in all severe affections much more than formerly. In the hospitals of Paris the treatment called expectorant (kermès, etc.), the eusthenic treatment (caffeine, etc.), and the revulsive treatment (cups, blistering, etc.) still are regarded as fulfilling the indications of the malady.

The treatment by alcohol (Todd's potion), which was much in vogue fifteen or twenty years ago, appears to be abandoned, or reserved for particular cases.

It does not seem possible, in this disease, to act upon the microbian element by inhalations or sprays, although oxygen may render aid when asphyxia is threatened. Attempts have been made to cause the antiseptic to penetrate as far even as the parenchyma of the lungs.

M. Lépine (of Lyons) is much occupied with this question. Relying on the innocuousness of intra-

PNEUMONIA.

Fibrinous pneumonia is caused by the presence in the pulmonary vesicles of the pneumococcus of Fränkel and Talamon, which does not differ from the lanceolate microbe of the saliva (Pasteur), *Diplococcus pneumoniæ* (Fränkel), or *Streptococcus lanceolatus Pasteuri* (Gamaleïa). It is the *Klebsiella salivaris* of Trévisan. At the period of suppuration the *Streptococcus pyogenes* and the other microbes of pus are found in the sputa.

M. Charrin explains the cyclic evolution of pneumonia on the theory that in this disease it is an accidental vaccination which is produced in the lung. The termination depends upon the intensity of the living virus, and the resistance of the organism, which protects itself by aid of the phagocyte cells of the pulmonary vesicles. If the inoculation has been too intense and is complicated with suppuration, death may follow. Otherwise the recovery takes place as soon as the epithelial cells of the pulmonary vesicles and the organism itself undergo vaccination, for the presence of pneumococci in the sputa persists for a long time after recovery (Charrin).

If this vaccination of the entire organism is a reality, and if the cyclic evolution of the pneumonia is not limited simply to the short life of the microbe and to its sensibility to an elevated temperature, it is certain that the vaccinal influence is not of long duration, since we have seen pneumococcus anginas supervene

A great number of antiseptics have been proposed or tried for tuberculosis. Let us pass rapidly over the treatments actually abandoned, or rarely used, and study those now considered the most efficacious, with strychnine (one milligramme per dose of the oil.)

Iodine and the iodides were formerly given in phthisis (Trousseau, Pidoux, Piorry). Cod-liver oil, which is still employed to a large extent, owes its effects in great measure to the iodine which it contains (it also contains chlorine, bromine, and phosphorus), so that it must not be considered simply as a sparing aliment (*aliment d' épargne*), being at once very digestible, furnishing respiratory materials, and acting as a reconstituent of histological elements.

However this may be, M. Jaccoud estimates that this medicament is not effective except in large doses —100, 200, and even 300 grammes per day when supported well by the patient; for this purpose it is associated with brandy, rum, kirch-wasser, ether, or with strychnine (one milligramme per dose of the oil).

For the fever, M. Jaccoud gives salicylic acid in doses of 2 grammes the first day, diminishing on the succeeding days (1.50 grammes, then 1 gramme), resuming at need the primary dose. When the patient is obliged to take doses very near together, the following potion is prescribed:

Salicylic acid	2.0
Salicylate of soda	5.0
Rum or cognac	50.0
Distilled water	5.0
Aromatic wine	120.0

If this mixture is poorly supported, hypodermatic injections may be given of a solution containing equal parts of water and salicylate of soda.

Iodoform, alone or associated with creasote (to which we will return later), is administered by M. Legroux according to one of the following formulas:

Iodoform Terpine	} ää	3.00
Turpentine		2.00
Marshmallow powder		1.50
Benzoic acid		2.00
Magnesia		1.50

(For sixty pills. Four to ten per day.)

Creasote Iodoform Terpine	} ää	5.0
Benzoic acid Larch turpentine	} ää	2.0
Marshmallow powder Magnesia	} ää	6.0

(For 100 pills. Four to ten per day.)

This formula may be varied by excluding terpine.

Inhalations of hydrofluoric acid, employed by M. Herard, are effected by conducting into a closed chamber air which has circulated in a gutta-percha vessel half-filled with the following solution:

Hydrofluoric acid	150.0
Water	300.0

The air is set in motion by bellows worked by the foot. After passing through the solution, and being

charged with hydrofluoric vapor, it is purified in a wash-bottle from the small remaining portions of sulphuric acid and hydrogen sulphide. The patient remains in the chamber one hour, and the air charged with acid is renewed every fifteen minutes.

Aërotherapy is one of the simplest and best treatments of pulmonary tuberculosis. As soon as those affected with the disease are able to leave home they are sent to pass the winter in regions where the climate is but slightly variable and the mean temperature allows almost constant life in the open air (Madeira, Algiers, Nice, Menton, Hyères, Cannes, etc.), or in elevated localities where the air is frequently renewed and is of great purity (Falkenstein and Gobersdorf, in the Alps). There is an establishment for fresh-air cure at Vernet, France, under the direction of Dr. Sabourin.—When it is not desirable to move the patient, aërotherapy is still possible at home.

M. Debove has recently tried in his practice the *treatment by open windows*, and has obtained good results. Patients placed in rooms with wide-open windows have well supported the severe cold of the late winters, the part of the room occupied by the patient being so sheltered as to avoid the extreme cold, yet receive the benefit of constant ventilation and fresh supplies of pure air.

M. Tapret, at the hospital of Saint-Antoine, uses air compressed and charged with the vapors of crea-

sote. The metallic bell invented by Paul Bert for his experiments in anæsthesia is used for this treatment. The patients remain in this bell four hours. Compression is slowly carried on by means of a pump, of which the air passes across shavings saturated with creasote. On an average, this air contains one milligramme of creasote per litre. At the end of half an hour the pressure reaches an atmosphere and a half; at this point it is maintained for three hours, then for the space of half an hour it is slowly relaxed. The patient inhales in this manner about four grammes of creasote. The treatment is renewed every day. Improvement is marked after several sittings; it is very evident at the end of several months.

Let us content ourselves with merely indicating other processes less used, notably injection of gases by the rectum—hydrogen sulphide, sulphide of carbon, and carbonic acid (Bergeron)—and the treatment by phosphates and phosphorated oil, which acts primarily upon nutrition, like cod-liver oil, and which may be employed together with the antiseptic treatment.

Tannin gives good results in pulmonary tuberculosis. MM. Raimond and Arthaud, who have made particular use of tannin, speak of it as follows:

"Tannin, administered in doses of one to five grammes per day, possesses an efficacy much superior to that of either iodoform or sulphide of carbon, especially in the treatment of the various acute forms. In almost all patients we have seen the cough from

the first day become less frequent, the expectoration less abundant, the night sweats arrested, the general enfeeblement lessened, and at the end of a fortnight we have generally observed in all patients with not too extensive lesions or absolute obstacles to nutrition a slight augmentation of weight, which continued during the entire period of the treatment."

I myself have had occasion to employ tannin, and I have noted that it was well supported, even when its use was continued for several months, and that it had a favorable influence on the bronchial secretion. It is given in capsules, to be taken before eating.

Creasote, however, occupies the highest rank in the treatment of pulmonary tuberculosis.

According to experiments made by Coze and Simon at Nancy in 1884, by injecting under the skin of guinea-pigs bacilliferous sputa which had been mixed for forty-eight hours with some antiseptic substance, creasote alone arrests the development of the *Bacillus tuberculosis.* Other antiseptics tried in the same manner (corrosive sublimate, eucalyptol, hydrogen, sulphur, helenine, thymol) have given no results.

MM. Bouchard and Gimbert, in 1877, again called attention to the creasote treatment by insisting on the use of beechwood creasote obtained by distilling the tar from this tree. Given in large doses (as high as 3.60 grammes), creasote effects, in favorable cases, a diminution of ex-

pectoration and of the cough, an amelioration of the physical signs and consequently a reduction of the fever and a revival of the strength; later it suppresses the night sweats, arrests the emaciation, and promotes appetite and return of flesh.

Creasote may be administered by the stomach. The following is the formula used by M. Dujardin-Beaumetz:

Beech-tar creasote	3.0
Alcohol	100.0
Common syrup	100.0
Wine of Bagnols	300.0

A tablespoonful morning and evening in a glass of sweetened water.

To this is joined the use of a phosphorated wine, the formula of which is as follows:

Phosphate of soda	6.0
Phosphate of potash	3.0
Syrup of bitter oranges	60.0
Wine of Bagnols	200.0

A wineglass at each meal as a tonic to the stomach.

Creasote mixed with oil may also be used:

Cod-liver oil	150.0
Pure creasote of wood-tar	1.0 to 2.0

Or the following pills:

Pure creasote of beech-tar Iodoform } ää	4.0
Liquorice powder	6.0
Honey	q. s.

(For eighty pills. Take eight per day.)

M. Bouchard employs the following wine of creasote:

Pure creasote of wood-tar	13.50
Tincture of gentian	20.0
Alcohol of Montpellier	250.0
Malaga wine	q. s. for 1 litre.

(Two to four tablespoonfuls every twenty-four hours, to be taken in a glass of water to avoid the irritating action of the creasote.)

M. Bouchard also injects creasote into the cellular tissue. For this purpose he dissolves the medicament in oil, which, while not irritating the tissues, permits of gradual absorption. He has even increased by concentration the strength of the solution to 50 per 100 without producing local accidents.—The dose of 25 centigrammes of creasote per kilogramme of weight of the body may be attained with no signs of intoxication, while the dose of 70 centigrammes per kilogramme would be fatal.—In general, only about three grammes of creasote per day are given, although, according to the preceding figures, this dose may be increased to 15 grammes. This injection must be introduced with great slowness.

M. Burlureaux, in his practice at the Military Hospital of Val-de-Grace, has employed upon a great number of patients subcutaneous injections of creasote, and has perfected the technique of these injections, using the apparatus of Gimbert (of Cannes) modified so as to render it more practical. This apparatus is designed for slow injection.

The apparatus of MM. Burlureaux and Guerder, constructed by M. Lamy, has two models. No. 1 is a flask of 300 c. c. with three tubulures, two above, one below, closed by rubber stoppers. To the upper part are adapted the air-tube and the manometer; to the lower, the tube for injection provided with a stop-cock. The air, forced by a hand rubber ball, does not enter the flask until it has passed through the wadding filter. The injection tube has an aluminium tip to which a hollow needle of platinum or gold is affixed. The flask is so graduated that each division represents 5 grammes of oil. The apparatus No. 2 does not differ from the first except in its more perfect and complicated construction: the hand-ball is replaced by an air-pump.

After assuring himself of the cleanliness of the apparatus, and sterilizing the needle, the operator fills the flask about two-thirds full and recorks it carefully; air is forced into it by pressure on the hand-ball, and the stop-cock with which the air-tube is provided is then closed. A second introduction of air is then made, which is generally sufficient—watch being kept upon the manometer. The oil is seen to rise in the manometer: when its level has attained the point D, the pressure is sufficient. The stop-cock of the injection tube is then opened to make sure that the needle is not plugged and that the liquid flows slowly, that is, about forty drops per minute—which represents 20 grammes per hour. The operator then proceeds with the injection.

After the skin is washed with an antiseptic solution the needle is plunged deeply into the cellular tissue, and the stop-cock is opened; the liquid begins to flow immediately. During the first five minutes it is well to keep watch in order to insure against accident (puncture of a vein, etc.)—which is very rare (once in 10,000 times). The physician may then leave the patient alone, or a nurse may keep watch over the manometer to see that the pressure is always maintained at the same level. When the prescribed dose has been injected, the stop-cock is closed and the pressure of air is lowered; the needle is then withdrawn, and a plug of absorbent cotton is pressed over the puncture for some minutes. It is the custom generally to prescribe rest after the injection; but certain patients have received progressively from 10 to 150 grammes (increasing 10 grammes per day) after coming a long distance, returning immediately afterwards. The average dose is 50 grammes of oil per day; the maximum dose has been 200 or 220 grammes at one sitting, which represents 14 grammes of creasote.

The liquid injected is composed of rectified creasote, perfectly free from phenic acid, and mixed with oil of sweet almonds or olive oil washed in alcohol, in the proportion of one gramme of creasote to 14 grammes of oil. The injection is but slightly painful because made slowly (from two hours and a half to eight and nine hours, according to the dose). In

the insertion of the needle, preference is given to the gluteal region, the thighs, or even the back. The patient, either reclining or seated upright, may read, eat, and in fact busy himself with almost any occupation which requires but little movement, while the injection is in progress.*

M. Pigot (of Bordeaux), on the ground that guaiacol is considered the active principle of creasote, and relying on the researches of Sahli and Fræntzel, employs guaiacol associated with iodoform. He gives it in capsules containing 5 centigrammes of guaiacol and one to three centigrammes of iodoform—two, four, or six capsules per day, after meals. This treatment is well supported and always ameliorates the state of the patient, the chances of success being the greater the sooner the treatment is begun.

M. Picot also uses a mixture of guaiacol and iodoform dissolved in sterilized olive oil for injections into the supra-spinous fossa (5 centigrammes of guaiacol and 1 centigramme of iodoform per cubic centimeter of the solution). The results have been of the best, especially in tuberculous pleurisy.

M. A. Weill (of the Rothschild Hospital, Paris) has employed the following mixture for hypodermatic injections:

Pure guaiacol.....	2.0
Oil of vaselin.....	100.0

*For further details upon this subject, see the *Journal de Médecine et de Chirurgie Pratiques*, t. lxii (1892), p. 49, art. 15020.

These injections were made in the abdomen or thigh. The absorption is very rapid; the patients feel the effects of the guaiacol within a few seconds after the injection. The amelioration is generally very evident, at least in tuberculous patients where the disease has not progressed too far. In fact, several have appeared to be cured.

Very recently M. E. Main has undertaken in the Cochin Hospital, in the service of M. Dujardin-Beaumetz, a series of comparative researches to ascertain if it is expedient to substitute guaiacol or any other of its components for creasote.* According to experiments made on animals, the author establishes the gradation of toxicity of the elements of creasote in the following order, the first on the list being the most toxic:

1. Paracresylol.
2. Phlorol.
3. Guaiacol.
4. Creasote (officinal).
5. Creosol.

The toxicity of all these bodies is feeble, and creosol is not therapeutically more active than creasote. The conclusion of the author is that creasote is preferable, as it is easier to use and less toxic than guaiacol.

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* *Bulletin Général de Thérapeutique*, March 15, 1892, p. 305 (Thèse de Paris, 1892).

C. Kohos, however, has just proposed a new mixture for hypodermatic injections, composed of creolin* and cod-liver oil, according to the following formula:

Cod-liver oil.....	100.0
Jeyes' creolin.....	2.0
Sulphuric ether.....	1.0

One to five cubic centimetres of this solution are injected every day into the supra-spinous fossa. This treatment has been giving good results.

Still it is creasote itself, in solution in sterilized oil, which must be considered the best antiseptic for the hypodermatic treatment of pulmonary tuberculosis; and, according to the expression of M. Dujardin-Beaumetz, the treatment of this disease may be summed up in two words: "Hygiene and creasote."

PLEURISY.

The exudations of pleurisy are sometimes sero-fibrinous, sometimes purulent. In the first case, bacteria are not generally found; in the second, the same microbes are found as in the lungs under certain morbid conditions (pneumococci, the bacilli of tuberculosis, streptococci, etc.).

Sero-fibrinous pleurisy is not ordinarily amenable to antiseptic treatment. Strizover (of Odessa) administers salicylate of soda (one gramme three times a day, after meals); the patient then takes a little

*We have seen that creolin is a badly defined body which owes its properties to cresylol, like lysol, which has the advantage of being better defined and is capable of being substituted for it.

strong wine. According to this writer, this treatment is not only followed by rapid recovery, but it serves also to *determine the diagnosis;* that is to say, all cases of pleurisy which do not get well in a few days under the influence of salicylate of soda must be considered as purulent or infectious.

Purulent pleurisy should be treated by thoracentesis (pleurotomy), performed, like other cutting operations, antiseptically, and followed or not, as seems best, by an injection of an antiseptic liquid.

It is not necessary to describe here the method of operation of thoracentesis. I shall simply indicate the principal antiseptic liquids which are actually employed. The injections ought always to be tepid.

Pure boiled water to which salt is added, boric acid in 4-per-cent. solution, salicylic acid, hydronaphthol (1 : 100), zinc chloride (1 to 8 : 1000), are used to wash out the pleural cavity, until the liquid runs out again absolutely clear. Phenic acid has caused fatal accidents and should not be used, especially in children. These injections are renewed, if expedient, and the drainage-tube which has been placed in the wound enables the medical attendant to watch the state of the pleura. The antiseptic dressing which covers this drainage-tube and the wound must be applied with the greatest care, and should be renewed as rarely as possible.*

* For further details on this subject, see Debove and Courtois-Suffit, "Treatment of Purulent Pleurisy" (Bibl. Med. Charcot-Debove), 1892.

CHAPTER II.

ANTISEPTIC TREATMENT OF DISEASES OF THE DIGESTIVE APPARATUS.

Having treated stomatitis in the preceding chapter, we refer the reader to it, and pass immediately to diseases of the stomach and intestines.

MICROBES OF THE DIGESTIVE TUBE.—A great number of microbes live habitually, we may say normally, in the digestive tube. All those which have already been noted in the mouth are found there, as well as others peculiar to the intestinal canal. They are ordinarily harmless; they may even be of use (Duclaux) in aiding the digestion of foods. In all cases they are compatible with perfect health.

"The physical and chemical conditions which prevail in the digestive tube realize admirably those which experience has shown to be favorable to the culture of micro-organisms (a constant temperature of 100° F., humidity, relative stagnation, periodical arrival of fermentable matter). The digestive tube is the paradise of microbes. Thus, in the world of microbes, harmless, useful, and disease-breeding species live side by side. The species which are habitually harmless when they do not develop in great

numbers, may become injurious by excessive multiplication. As for species truly pathogenic, they are probably present only intermittently."—(Legendre.†)

The stomach, placed at the entrance of the digestive canal, constitutes a veritable barrier to the invasion of pathogenic microbes, owing to the *gastric juice* secreted by its mucous membrane; this fluid by its acid principle is an excellent antiseptic, neutralizing the baneful action of many bacteria. Farther down the intestinal fluids and the bile exercise their protective action, and the microbes are swept along with the fæcal matter to the anus. But if the gastric juice is altered or does not contain its normal proportion of hydrochloric acid; if the bile ceases to be poured into the duodenum, on account of an obstruction in the common bile-duct or from any other cause, digestive troubles immediately ensue, which must be remedied by rational therapeutic measures in which antiseptics occupy the first rank. The incomplete digestion of foods produces gastro-intestinal putrefactions, which are the source of various systemic poisonings by reason of the introduction into the blood of substances normally eliminated with the fæcal matters (indol, skatol, etc.); these putrefactions favor at the same time the abnormal development of microbes. The danger is still greater when bacteria essentially pathogenic, such as those of typhoid fever

† Traité Pratique d'Antisepsie, i, p. 331.

or cholera, are accidentally introduced by drinks, foods, or any other means.

STOMACHAL DYSPEPSIA; DILATATION OF THE STOMACH.

Whatever may be the nature of the dyspepsia, it is often useful to administer antiseptics, but it is pre-eminently in the forms called *atonic*, *putrid*, *catarrhal*, and *flatulent* that these medicaments are indispensable. Lavage of the stomach, employed especially when there is dilatation, is beneficial in removing alimentary residua which cannot pass into the intestine.

Charcoal powder (Belloc's charcoal) is the oldest of all the antiseptics which have been employed as disinfectants of alimentary matters incompletely digested and remaining in the stomach.

Before the modern antiseptics, such as naphthol, were introduced into practice, M. Dujardin-Beaumetz used weak solutions of boric acid (1 to 2 : 100), or, better, a solution known as sulpho-carbonated water (liquor carbon-disulphide), obtained by shaking perfectly pure sulphide of carbon with water, care being taken to decant the mixture. The following is the formula:

Pure sulphide of carbon.....	25 Gm.
Water.....	100 Gm.
Essence of mint.....	30 drops.

Place this mixture in a deep dish of a capacity of about 700 cubic centimetres, shake and allow it to settle. Add water as fast as it is drawn off in order to maintain the liquid

If it is preferred to employ these different antiseptics pure and without the addition of other powders, they may be given in capsules of 50 centigrammes each.

INTESTINAL DYSPEPSIA; DIARRHŒA; CONSTIPATION; GASTRIC OBSTRUCTION; POISONING BY SPOILED MEATS; ENTERITIS, ETC.

All the antiseptics which we have indicated as useful in the treatment of gastric dyspepsia are of equal importance in intestinal dyspepsia; it may even be said that the greater part of these antiseptics, being insoluble in water and little or slowly soluble in the liquids secreted by the stomach and intestines, act upon alimentary substances only in this part of the digestive canal, or continue here the action commenced in the stomach. We shall see elsewhere that there are distinctions to be made in the choice of these different antiseptics, according to the nature of the lesion.

The purgatives, and preferably the saline purgatives (sulphate of soda, sulphate of magnesia, natural purgative waters), replace here lavage of the stomach, and act by rapidly eliminating foods that are poorly digested or that contain toxines.

Charcoal powder, already employed by Trousseau and Belloc, has been long used by M. Bouchard as an agent in intestinal antisepsis. With the dose of 100 grammes per day (about three ounces and a quarter)

he obtains the deodorization and discoloration of the fæcal matters, and even of the urine by opposing the resorption of bilirubin in the intestine. But charcoal has little action other than as an absorbent; we possess more active medicaments to-day.

Vulpian was the first to employ salicylate of bismuth and iodoform. Others have made use of calomel, which is transformed into a bichloride in the stomach and into a sulphide of mercury in the intestines.

M. Bouchard shows that these substances, generally *insoluble*, should be in the state of an impalpable powder, in order that their particles may come into most intimate contact with the epithelial coat of the intestines; he also points out that it is best to administer them in small doses often repeated, in order not to give the microbes productive of toxines and putrid fermentations sufficient time to multiply.

Naphthalin in the pure state and finely divided has been employed by M. Bouchard; it is obtained in this state by precipitating it with water from its alcoholic solution. Five grammes per day may be given according to the following formula:

Naphthalin Powdered sugar	} ää.....	5 Gm.
Essence of bergamot.....		2 drops.

(Divide into twenty powders. Sig.: Take one every hour.)

Naphthalin has the evil of provoking multiform eruptions accompanied by a pruritus very annoying

to the patient; hence naphthol, which is supported much better, is preferred to it.

Naphthol β is used by M. Bouchard for intestinal antisepsis; its toxic equivalent is but 1.60 grammes per kilogramme of body weight, and, although it is generally considered insoluble, experience shows that it is slightly soluble in water by prolonged shaking (0.20 gramme per 100). By adding a little alcohol to the water, a litre dissolves 0.33 gramme. The naphthol-water thus prepared possesses an incontestable power as an antiseptic.

Naphthol or betol may be administered according to the formulæ previously indicated for the treatment of gastric dyspepsia, or, if preferred, in the form of granules (Bouchard). The formula is as follows:

Charcoal		50.0
Naphthol Salicylate of bismuth	ää	2.50
Sugar, q. s. to produce granulation.		

Granules convenient for use may thus be prepared. Dose, a teaspoonful in a little water.

But the medicament which appears to suit best in intestinal dyspepsia, according to the most recent researches, is benzonaphthol.

Benzonaphthol, or benzoate of naphthol β, is, according to M. Gilbert, the best antiseptic for the intestine, seeing that it is there only that it acts, while naphthol itself is a *gastro*-intestinal antiseptic the action of which begins in the stomach.

Benzonaphthol enters the intestine without being modified by the gastric juice; it there breaks up into naphthol β and benzoic acid. Consequently it is an *intestinal* antiseptic exclusively.

The feeble solubility of benzonaphthol in water and the gastric juice limits, then, its field of action. But this medicament has the advantage that it does not disturb the chemical processes of the stomach when they are normal. *Betol* also possesses this quality.

Benzonaphthol presents the advantage over betol of having a superior antiseptic power in consequence of the substitution of benzoic acid for salicylic acid. It is also to be noted that whenever the kidney is diseased, as in Bright's disease, salicylic acid is dangerous even in small doses; besides, benzonaphthol is much less toxic. In diseases of the liver and in nephritis, then, the latter medicament is exclusively indicated. It is administered in doses of two to five grammes per day, in capsules of ½ gramme (7½ grains) at regular intervals.

To sum up: For gastric antisepsis, lavage is the principal resource, while gastro-intestinal antisepsis should be effected by naphthol β, and antisepsis exclusively intestinal by benzonaphthol.

It will, then, be advisable to employ benzonaphthol in preference to the sulphide of carbon and to naphthol, with or without the addition of salicylate of bismuth, in typhoid fever, diarrhœa of microbian

origin, dysentery, enteritis, typhilitis, and colitis, whatever may be the cause.

The simple or antiseptic lavements constitute medications of easy application whose indications are found not only in rectitis of infectious origin, but also in all affections of the large intestine. Solutions of boric acid, tannin, lead acetate, perchloride of iron, iodine in iod. pot. solution, silver nitrate, corrosive sublimate, etc., have been employed successfully. Injections play the same antiseptic rôle here as lavage of the stomach and saline purgatives in other parts of the digestive tube.

FURUNCULOSIS.

The furuncle (boils, carbuncles, etc.) should be considered as the cutaneous manifestation of a general affection which is always accompanied by the production of toxines in the intestine. It is, then, necessary to associate with the local treatment of the furuncles a general treatment, the basis of which is intestinal antisepsis, together with a rational hygiene.

M. Bouchard has shown that a furunculous eruption may be arrested by intestinal antisepsis. It has also been long known that a close relation exists between the functions of the intestines and those of the skin. In furunculosis, besides the local infection which is caused by the dissemination of microbian germs on the cutaneous surface, there is need of taking into account the predisposition which results from systemic poisoning of intestinal origin, and from

the consecutive irritation which, joined to the rubbing and the scratching, favors the inflammation of the sebaceous follicles which constitute a means of entrance for pyogenic microbes (staphylococci and streptococci.

With the local treatment, consisting of lotions of boric acid or corrosive sublimate, and applications of rings of *emplastrum de Vigo cum mercurio* to each papule, whether suppurating or not, intestinal antisepsis should be associated. M. Bouchard gives the following capsules:

Naphthol β, finely pulverized.....	15.0
Salicylate of bismuth.....	7.50

For thirty capsules. Take from three to twelve per day.

M. Gingeot paints the furuncle with tincture of iodine, and makes general lotions with water containing boric acid, sulphur, or corrosive sublimate, while administering internally the following powder:

Sodium sulphide Bicarbonate of soda Sulphate of potash Tartaric acid Gum arabic	ää 10 Gm.

From one-half gramme to four grammes per day, in eight or ten doses, in water or milk.

ANTISEPSIS OF DISEASES OF THE LIVER.

It is well known that the liver, continuously traversed by blood from the intestines, has for one of its

functions the arresting of toxines which, fabricated by microbes in the alimentary canal, are brought to the liver by the portal vein, and which are later eliminated by the kidney. It is supposed that this neutralization of the toxines of the blood is related to the glycogenic function of the liver (G. H. Roger).

But whenever the hepatic gland is morbidly deranged, this faculty of arresting or neutralizing toxines is altered or suspended. This is what is observed in simple icterus (jaundice), in grave icterus, in hepatitis and cirrhosis, and even in those transient engorgements of the liver which nearly always accompany intestinal affections, fevers, etc. In all these diseases, internal antisepsis is the more obligatory from the fact that the kidney is equally menaced by reason of the presence in the blood of bilirubin, a product of excretion of the liver ordinarily poured into the intestine, which colors abnormally the urine and all the liquids of the human economy.

Whenever there is an obstruction of the common bile-duct, from any cause, icterus ensues, and, the bile ceasing to be poured into the duodenum, the fæcal matters are expelled decolorized and exhaling a putrid, repulsive odor. The bile is, in fact, an energetic antiputrid agent, and opposes the microbian fermentations which may arise in the intestines from the presence of alimentary residua. M. Dujardin-Beaumetz has insisted upon the necessity of opposing this intestinal putridity, to which he assigns a

causative rôle in the production of the nervous symptoms attending prolonged icterus—the disturbance being immediately due to the absorption of toxines into the organism from the surface of the intestines.

The antiseptics which agree best in these cases are calomel (the purgative action of which may be utilized by associating it with euonymin), charcoal powder, and especially *benzonaphthol*, conformably to the indications formulated above.

ANTISEPTIC TREATMENT OF PERITONITIS.

The inflammation of the peritoneum is either primary (?), or consecutive to inflammation of some one of the abdominal organs. Even when this inflammation is not at first septic, it almost always becomes so after a time, either by reason of perforation of the organ affected, or by the inflammatory process itself, which renders possible the migration of leucocytes and microbes through the inflamed and friable walls of the abdominal viscera.

The microbes which are found in the peritoneal exudation are of species varying according to the primary affection of which the peritonitis must be considered a complication. The most common are the *Staphylococcus aureus*, the *Streptococcus pyogenes*, the *pneumococcus* (*Klebsiella salivaris*), and *Bacillus tuberculosis;* the last is the bacillus usually found in the peritonitis of children.

According to MM. Cornil and Babes,* "peritonitis is invariably secondary to a lesion which takes its point of departure in the inflammation of some organ contained in the abdominal cavity, or else in the generalization of certain microbes which have a special effect on the serous membranes"—as those cited above. It may be said that microbes are present in every acute peritonitis, fibrinous or puriform.

The first indication in peritonitis is to effect internal antisepsis as complete as possible by the means already indicated; calomel, and principally naphthol and benzonaphthol, should be administered according to the formulæ previously given, account being taken of the greater or less tolerance of the stomach. The salts of quinine, if indicated, may be associated with these medicaments.

Peritonitis being always local at the start, and the gravity of the affection depending essentially on its generalization, which renders it rapidly fatal, all the efforts of the physician should tend toward the prevention of the spread of the inflammation, especially when this is primarily of septic origin.

"The extension of a peritonitis," says Bouchard, "consists in a succession of inoculations resulting from the movements of the intestine, which break up and diffuse the septic matters effused between the convolutions, or the liquid exudate secreted by the serosa, and containing the pathogenic agents. It is the in-

* Cornil and Babes, "Les Bactéries," 3d ed., ii, p. 40.

testines themselves which transport the septic organisms and disseminate them. There is, then, an urgent indication to prevent this transportation by immobilizing the intestine in order that the peritonitis may remain circumscribed. This is indirect antisepsis."*

This result is attained (or sought) both by internal and external treatment.

Internally, purgatives must from the first be avoided, from fear of generalizing the peritonitis. Hence, even when calomel is given, as in infantile practice, it must be associated with opium. [This is old practice, now abandoned. In American practice we do not fear to open the bowels by a full dose of calomel at the onset, nor to give saline purgatives occasionally during the disease, and recovery oftener coincides with freedom of the bowels than with constipation.—TRANS.]

Opium is, in this respect, a heroic medicament which calms the pain in immobilizing the intestine. [It may be necessary to give a grain of solid opium every hour or two in pill form, or a tablet of morphia, one-eighth to one-fourth grain. The morphine may, if preferred, be given subcutaneously, with or without atropine. Some practitioners prefer the deodorized laudanum, of which from ten to twenty drops may be given every two hours, according to indications. Patients bear immense doses of opiates in

* Bouchard, *loc. cit.*

peritonitis. I have known it to be necessary to give half a grain, and even a grain, of opium in pill form every hour for several days. I think most practitioners in this country prefer the *pil. opii* to every other form.—TRANS.]

Constipation, even when prolonged for a fortnight, is much less dangerous than movements of the bowels provoked by the unseasonable and forced introduction of aliments, sure to be followed by vomitings which agitate and disturb the contents of the abdomen (Bouchard). The physician should be content with iced water in small quantities, and, for nourishment, lavements by the rectum. [Excellent nutrient lavements are made with peptonized beef stirred into milk, pancreatinized milk, milk and egg with a little dilute muriatic acid and pepsin, etc. Not more than four or five fluidounces should be injected at a time, and not oftener than every five hours. The injections are better retained with the help of a few drops of laudanum.—TRANS.]

The external treatment consists in immobilizing the walls of the intestines by different means: layers of wadding kept on by a bandage; a coating of castor oil and collodion; ice over the abdomen, care being taken to place a piece of thick flannel between the ice-bag and the abdomen (Siredey).

M. Debove, in order to avoid the surgical treatment with all the apparatus of laparotomy, in tuberculous peritonitis, makes a puncture with the trocar

of the aspirator, and washes out the abdomen with two litres of a saturated solution of boric acid or with water sterilized in a dry stove (*autoclave*) at 120° C. (about 260° Fahr.).

Topical applications over the abdomen may be themselves antiseptic: inunctions of mercurial ointment or other substances of the same nature. Recently ichthyol has been recommended, applied so as to form a thick coating and then covered with sticking-plaster; the whole is kept in place by a bandage. These different topical agents give results very superior to vesicatories, which are generally badly supported. The antisepsis of the genital organs is imperatively indicated in women, especially when the peritonitis is of uterine origin; it may be accomplished by means of appropriate injections.

In all cases it must not be forgotten that intestinal antisepsis renders possible and inoffensive the immobilization of the intestines, carried as far, even, as constipation (Bouchard), for this is only dangerous by the putrefaction of matters retained in the intestines, and antiseptics prevent this putrefaction.

CHAPTER III.

ANTISEPSIS OF DISEASES OF THE CIRCULATORY SYSTEM.

ENDOCARDITIS, MYOCARDITIS, PERICARDITIS, DISEASES OF THE BLOOD-VESSELS.

Endocarditis must be considered as a secondary disease following acute articular rheumatism, pneumonia, typhoid fever, puerperal infection, or coming in the train of pyæmias and septicæmias consecutive to wounds. But all these diseases, notably pneumonia, acute rheumatism, typhoid fever, etc., "are due to the presence of micro-organisms, and are in reality infectious diseases; so that we may consider endocarditis as equally in relation with the bacteria which circulate in the blood" (Cornil and Babes). We owe the first mention of bacteria in ulcerous endocarditis to Rokitansky (1855), although he did not indicate the microbian nature of the granulations of which he gave an excellent description.

Bacteria are also observed in myocarditis and pericarditis. These two affections are usually seen as complications of valvular ulcerous endocarditis. Pericarditis may, however, precede endocarditis and provoke it, being itself caused by pyæmia—notably by a phlegmon of the mediastinum.

Endocarditis is frequently complicated by metas-

tatic infarctions and abscesses due to the transportation by the general circulation of fibrinous fragments filled with microbes. Endarteritis is observed also either as a primary affection or as the result of endocarditis.

The principal microbian agents of these lesions are, first, those of pus (*Staphylococcus pyogenes aureus* and its varieties *albus* and *cereus albus*, *Bacillus pyogenes fœtidus* of Passet, *Streptococcus pyogenes*), then the pneumococcus or lanceolated diplococcocus (*Klebsiella salivaris*), the *Bacillus tuberculosis*, saprogenous bacilli, etc.

The antiseptic treatment of the diseases of the circulatory system is much less advanced than that of the diseases of the digestive apparatus, because of the difficulty of instituting a local treatment. The problem here is, in short, to realize internal antisepsis and reach the microbes which circulate in the blood and are carried by it to the heart and blood-vessels. This result is not possible except by *general antisepsis*, which is exceedingly difficult to effect by the means at our disposal, since clinical experience has not yet sanctioned intravenous injections of soluble antiseptics which seem to be theoretically indicated.

As for the insoluble or slightly soluble antiseptics, such as naphthol, administered by the alimentary canal, they act also, perhaps, in a certain measure as [illegible] by the slight portion which is [illegible] medicaments necessarily pass

through the liver, which diminishes the antiseptic power of substances which traverse it, as it diminishes the toxicity of septic substances which pass the same way. However, these antiseptics are found to be of some use, particularly in the treatment of the local malady, the first cause of the circulatory lesions which occupy us here, and in accomplishing intestinal antisepsis, which must not be neglected, especially in view of the complications liable to ensue in the renal emunctory.

The antiseptics soluble in the alimentary canal, such as salicylate of soda, find their use notably in the treatment of rheumatic endocarditis. The salts of quinine, which enter into the same category, are indicated in the cardiac affections consecutive to pyæmia, and even in rheumatism (Bucquoy).

For antisepsis at once intestinal and general, preference will be given to *benzonaphthol* by reason of its favorable action on the function of the kidney, and it should be administered concurrently with diuretics and the milk diet.

Among the medicaments still used in the treatment of pericarditis and endocarditis, and which are associated more or less with the class of antiseptics, it is well to mention tartar emetic given in large doses (Jaccoud), and the iodides. The latter, as well as the bromides, are indicated in the greater part of the diseases of the heart (G. Sée). The iodides act at the same time as tonics, the bromides as hypnotics.

CHAPTER IV.

ANTISEPTIC TREATMENT OF DISEASES OF THE URINARY AND GENITAL APPARATUS OF BOTH SEXES.

In this chapter will be treated diseases of the kidney, bladder, and external genital organs. A special chapter will be devoted to midwifery and gynæcology.

Infectious Nephritis.—Inflammation of the kidney of microbian origin may be either primary or consecutive to a general infectious malady (traumatic septicæmia, erysipelas, osteomyelitis, diphtheria, scarlatina, etc.). A large number of species of bacteria may be present in the kidney, and consequently in the urine. Nevertheless, some of these microbes circulate in the blood without producing lesions of the renal parenchyma (septicæmia of the mouse and rabbit, according to Koch), and microscopical examination of the urine does not in this case show bacteria (Cornil and Babes). We know, moreover, that normal urine does not contain microbes, but that they are habitually present when the blood which traverses the kidney is charged with notable quantities.

The species of microbes found in the urine are generally those of the initial malady, but frequently

they are associated with suppuration or gangrene consecutive thereto.

The experiments made by MM. Cornil and Berlioz with the bacillus of jequirity,* prove that the kidney is one of the principal avenues of elimination of the microbes of the blood; this elimination is rapid, and may proceed without any appreciable inflammation of the uriniferous tubes. In poisoning by jequirity, which is rapidly fatal in the frog, "sections of the kidney show a colossal quantity of bacilli in all the vessels, and numbers of these organisms both in the cavities of the glomeruli and in the interior of the uriniferous tubules. The urine collected from the bladder also contains bacteria. However, although the presence in the blood and the elimination of these organisms by the kidney may have lasted several days, the cells of the uriniferous tubules appear normal; the cavity of the tubules is not dilated and does not contain products of pathological secretion. If a great quantity of the infusion of jequirity (two or three cubic centimetres) be injected into one of the large veins of a rabbit's ear . . . . . bacteria appear in the bladder an hour and a half after the injection" (Cornil and Babes).

The experimental demonstration of these facts is

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* It is now known that this bacillus, which probably does not differ from the *Bacillus subtilis*, does not possess the pathogenic properties formerly attributed to it, but that these are due to *abrine*, the principal soluble poison of jequirity.

very important from the point of view of the therapeutics of infectious diseases. It proves that *so long as the kidney is intact*, or nearly so, and accomplishes normally its function as a filter of the blood — an intelligent filter, or "*selective filter*," according to the expression of M. Dujardin-Beaumetz — the elimination of microbes by this emunctory is possible. It explains also the danger of infectious diseases in persons affected with diseases of the kidney (albuminuria, Bright's disease). It moreover establishes the indication that it is of great importance in all diseases of microbian nature to favor the function of the kidney by appropriate diuretics, so as to prevent the sojourn and accumulation in the uriniferous tubules of microbes which will in the end provoke inflammation of these tubules by the production of toxines.

Under the name of *ascendant nephritis* are classed those diseases in which the microbes, instead of being carried to the kidney by the general circulation, ascend from the bladder, which is affected with purulent cystitis, and enter the uriniferous tubules by way of the ureters and the calices. This form presents itself in calculous cystitis, in compression of the ureters by ovarian tumors, cancers of the cervix uteri, etc. It may be consecutive to simple catheterization when this operation is not aseptic. The microbes encountered in this case have been studied by Clado (Thèse de Paris, 1887), and consist of a dozen different species, of which one, which he has described under

the name of *septic bacterium of the bladder*, seems peculiar to this form of cystitis and nephritis. It is the *Bacterium pyogenes* of Albaran and Halle (1888). More rarely, nephritis consequent upon blennorrhagia, and provoked by the *Micrococcus gonorrheæ* (Neisser), is observed. Other micrococci have been described by Doyen (1887) as present in the urine of patients affected with cystitis and pyleo-nephritis.

Despite what has been above stated, according to experiments made on animals to throw light on the probable passage of bacteria through the kidneys without appreciable trace of local inflammation, autopsies made on man after death from infectious nephritis seem to show that bacteria do not not pass in any great numbers into the urine except through manifest renal lesions (inflammation, vascular ruptures, ecchymoses, etc.). In all cases, the local action of microbes and their toxines is much more intense when the kidney is affected with some trouble of nutrition (Cornil and Babes). Albuminous urine nearly always contains leucocytes and bacteria in greater or less numbers. The danger is much greater when this albuminuria is chronic.

Antiseptic Therapeutics of Nephritis.—Diuretics, empirically employed since ancient times, here accomplish the same rôle of irrigation as lavage of the stomach and saline purgatives in affections of the digestive tube. The urine being scanty and thick, there is an indication to render it more abundant and

to dilute the saline substances which it contains so as to diminish the mechanical obstruction of the renal filter.

Purgatives and vapor baths, used concurrently, supplement the renal function by enlisting the intestines and the skin in the work of eliminating urea and other products of excretion normally removed by the urine, as well as the toxines which, on account of renal insufficiency, may have been left in the blood.

Milk, in the exclusive milk-diet treatment, acts at once as a diuretic and as a complete aliment. It has the advantage over all other aliments of being easily supported, of modifying the albumen of the blood, and of reëstablishing the functions of nutrition (Dujardin-Beaumetz) by introducing into the stomach and intestines the nutrient which demands the least possible digestive labor, and which, consequently, penetrates the most rapidly into the economy, offering the minimum of material for putrid fermentation in the intestines. Whenever it is possible, fresh milk is prescribed, uncooked and raw, in order to realize as nearly as possible the conditions which nature has indicated in preparing this food for the new-born child. One to three quarts per day may be prescribed, pure or with the addition of Vichy water (Saint-Yorre) or Vals water (Saint-Jean)—a large spoonful to each glass of milk—which aids its toleration by irritated stomachs, especially when there is an excess of acidity of the gastric juice.

In place of cows' milk, M. Lancereaux prescribes asses' milk, or, if this cannot be obtained, cows' milk that has been kept less than twelve hours and well skimmed. To this should be added four to ten grammes of sodium chloride per quart. This treatment must not be continued more than eight days if the patient does not improve.

Vegetable diuretics (digitalis, uva ursi, horse-radish, scoparius, squill, etc.) are employed in infusion, singly or associated with cream of tartar.

Milk sugar, or lactose, is also an excellent diuretic, recommended by M. Germain Sée, in doses of 100 grammes (between three and four ounces) per day, in all cases where the milk itself is poorly supported. MM. Dujardin-Beaumetz and Dastre have shown that *glucose* produces the same effects, but in larger doses (200 grammes daily in ptisan). The latter medicament is generally better tolerated by reason of its taste, which resembles more nearly that of common sugar.

Benzoic acid is the diuretic antiseptic *par excellence*. It is employed pure or in the form of benzoate of soda or benzonaphthol.

M. Laboulbène prescribes as a ptisan the following potion:

Benzoic acid.....	1.0 to 2.0
Sugar...	100.0
Distilled water.....	950.0

Sig.: To be drank in tumblerfuls.

Glucose may be substituted for common sugar if it is desired to utilize the diuretic properties of grape-sugar.

Benzoate of soda presents the advantage over benzoic acid of being quite soluble in water (while one gramme of the acid demands 400 grammes of water). It is used in doses of one to three grammes (15 to 45 grains) in a potion of 150 grammes (5 ounces), to be taken by tablespoonful doses. It is especially serviceable in the uric diathesis.

It may be prescribed in the form of a solution (Dujardin-Beaumetz):

Benzoate of soda.....	10.0
Orange-flower water.....	20.0
Distilled water.....	270.0

This solution contains one-half gramme (7½ grains) of benzoate per tablespoonful. Ten grammes (150 grains) of bicarbonate of soda may be added.

The *dialytic syrup* of Bonjeau contains:

Benzoate of soda.....	30.0
Silicate of soda.....	50.0
Syrup of acacia.....	1000.0

(One to two tablespoonfuls per day.)

Tannin, either pure or in the form of red wines rich in tannin, has also been employed for albuminuria.

Fuchsin is to-day more in favor. For the child,

M. Bouchut prescribes the following potion associated with the milk diet and sudorifics (wet-packs):

Fuchsin	0.50 Gm.
Essence of mint.....	2 drops.
Syrup of acacia	100.0 Gm.

(By teaspoonfuls during the day.)

This medicament has the disadvantage of coloring the lips and teeth red; it is for this reason better to administer it in capsules whenever possible, particularly in the adult.

M. Dujardin-Beaumetz prescribes, concurrently with injections of pilocarpine (sudorific), the following capsules:

Fuchsin, 0.50 Gm.

(In two capsules, to be taken during the day.)

Intestinal antisepsis may be effected by benzonaphthol either singly or associated with magnesia, bicarbonate of soda, etc., in doses of ½ gramme (7½ grains) of this antiseptic in capsules or wafers, to be taken at meal-time.

Oxygen in inhalations is one of the best treatments to employ in albuminous nephritis (Dujardin-Beaumetz), especially when it is necessary to combat rapidly accidents due to blood-poisoning.

INFECTIOUS CYSTITIS.

The indications in cystitis resemble much those of nephritis. Combat first the inflammation of the

bladder, and dilute the urine charged with toxic principles by warm emollient drinks, alkaline and sulphur waters, like those of Contrexeville, Vichy, or the lithia waters like the Buffalo lithia. The milk diet is to be imposed. If the urine is purulent, it will be well to wash out the bladder with warm boric-acid water, though such lavage is contra-indicated in acute cystitis.

Benzoate of soda may be administered, according to the following formula:

Benzoate of soda Benzoate of lithia	ää	1.50
Syrup of Tolu		50.0
Distilled water		100.0

M. Sig.: The whole to be taken during the twenty-four hours, in frequent tablespoonful doses.

Turpentine or sandalwood-oil may be given in capsules to modify the urine and prevent ammoniacal putrefaction. Purgatives act as derivatives to the intestines.

In acute cases, Guyon employs instillations of nitrate of silver, carried to the fundus of the bladder. The patient is first made to urinate, and a No. 13 or 14 instillator-catheter is used. When once the membranous urethra is passed, the handle of the catheter is depressed and the point brought forward nearly to the sphincter vesicæ. The instillation is begun in the prostatic portion. The quantity instilled is twenty to

thirty drops of a 1:50 solution. After several days the solution can be increased to 1:40 or 1:20.

In chronic cystitis, Guyon prescribes injections of nitrate of silver, 1:500, one or two fluidounces; the injection is stopped when the fluid comes out clear. At the same time, pills are given every four hours, consisting of 2 grains each of Venice turpentine and extract cinchona.

The following prescription is also advised along with the balsams:

Benzoic acid	4.0
Glycerin	4.0
Mistura acacia	120.0

M. Sig.: A tablespoonful every three hours.

Intra-vesical injections are indicated whenever the urine is stagnant. [For this purpose the rubber hand-ball syringe adapted to a soft-rubber catheter may be employed; the injection should be thrown slowly, at about the heat of the blood. The hand-ball syringe should hold about two ounces, and this quantity should be allowed to flow out before a new quantity is injected.] The liquids to inject are boric acid, 4 per 100; sulphate of copper, 1 per 100; tannin, 1 or 2 per 100; phenic acid, 1 per 100; nitrate or silver, 1 per 500.

In chronic blennorrhagic urethro-cystitis, it is well to instill ten to twenty-five drops of the above solution of silver nitrate into the prostatic urethra.

BLENNORRHAGIA IN BOTH SEXES.

Blennorrhagia (gonorrhœa) is produced by the inoculation in the canal of the urethra of the micrococcus or gonococcus of Neisser. This very rebellious affection, which is often complicated with cystitis, tends to become chronic. The most energetic antiseptic treatment is indicated from the very onset of the disease, if we would prevent the inflammation of the urethral mucosa from being propagated to the bladder. Especially should the physician use precaution that the treatment and, above all, the *ascending injections* do not contribute to the propagation upwards of the microbic infection primarily localized in the anterior part of the urethra. To avoid such propagation, it is better to use the *syringe with retrograde jet* devised by Langlebert, the cannula of which should always be previously sterilized.

According to Mauriac, it is well to begin with the balsams, which may of themselves cause a definitive cure. The antiseptic *abortive* treatment has no chance of succeeding unless resorted to the first day or so following the infection; but the physician is never consulted at that time. Later on it is dangerous.

The balsams commonly given are copaiba, sandalwood oil, and gurjun oil. The following are English recipes:

Ol. santali..... ℥ ss.
Liqui. potas..... ʒ ij.
Syr. acaciæ..... ..... ℥ j.
Aquæ fœniculi.....q.s. ad ℥ iij.

M. Sig.: A teaspoonful well diluted after eating.

℞ Bals. copaiba..... ℥ ss.
Liquor potass .... ʒ ij.
Syr. Tolu..... ℥ jss.
Ext. licorice .... ʒ ij.
Aquæ menth. pip.....q.s. ad ℥ iij.

M. Sig.: One or two teaspoonfuls.

℞ Bals. copaiba..... ..... ʒ iv.
Syr. Tolu
Syr. acaciæ } ää..... ʒ viss.
Aquæ menth. pip.

M. Shake. Sig.: Teaspoonful.

It is generally expedient to wait eight or ten days, till the acute stage has subsided, before giving copaiba, and when the copaiba, sandalwood or gurjun oil is given it should be in frequently repeated doses so that the urine may be always charged with the active principle at the time of emission (Dujardin-Beaumetz). One of the copaiba capsules may be given every four hours, then every two hours, as the stomach will bear them.

Vidal's formula for gurjun oil is as follows:

Gurjun oil } ää..... 4.0
Gum arabic }
Infus. anise..... 40.0

M. Sig.: To be taken in two doses.

For injections the practitioner may use zinc sulphate or zinc sulpho-carbolate, one or two grains to the ounce; lead acetate, one grain to the ounce in decoction of poppies; or tannic acid, according to the following formula:

Acid, tannic Alum	ää	1.0
Red wine Rose-water	ää	100.0

M.

Or 3 parts of tannin to 100 of glycerin for a topical application. Permanganate of potash, lime-water, corrosive sublimate (in weak solution, 1:50000) have also been recommended. [The routine treatment at the Johns Hopkins, Baltimore, Hospital is the injection of corrosive sublimate, night and morning, by means of a fountain syringe and suitable cannula; the strength of the injection is seldom greater than 1:50000].

Of the anti-parasitic injections, permanganate of potash has a high rank. The strength of the injection should not be greater than one grain to five fluid-ounces of water.

For other prescriptions, the reader is referred to any modern text-book on venereal diseases.

M. Dreyfus prescribes salol internally as the best antiseptic of the urinary organs, because all its action is brought to bear on these organs. Salol breaks up in the intestine into phenic and salicylic acids, which are both eliminated by the urine, the first in the state of

phenyl sulphate, the second as salicylic acid; salol thus might be supposed to have an analgesic action similar to that of the salicylate of soda in rheumatism.

Salol is prescribed in doses of five to eight grammes per day, either alone or associated with the balsams. This medicament would be contra-indicated in acute or chronic albuminous nephritis.

M. Vigier has recently recommended retinol, which is of easy application. In blennorrhagia it acts upon the discharge much more rapidly than the other antiseptics, and effects prompt amelioration. It causes no pain, and always appears to be well supported.

Blennorrhagia in the female is treated in the same manner as in the male. The affection is less obstinate and yields more easily to injections of sulphate of zinc, sulphate of copper, corrosive sublimate, etc.

The physician will be on the alert to avoid complications on the part of the uterus and its annexes, such as might follow sublimate injections, or inunctions with mercurial and belladonna ointments. When these complications occur, the treatment is similar to that of peritonitis.

The local antiseptic treatment of leucorrhœa does not differ from that of blennorrhœa.

The treatment of chronic blennorrhagia is much like that of cystitis, and is based upon the use of nitrate of silver (Guyon). The method of procedure is here of great importance, and is as follows: A flexible gum bougie with bulbous tip, hollow

throughout its whole length, and having at the top of the bulb a filiform orifice, is introduced to the proper depth. A Pravaz syringe holding three cubic centimetres, with conical cannula, is adapted to this bougie. The apparatus must be primed before using; for this purpose, the syringe being charged and fixed to the sound, the operator presses the piston till a drop appears at the orifice at the end of the bougie.

For the posterior urethra, it is necessary after passing the membranous portion to push the piston so as to inject from twenty to thirty drops.

For the anterior urethra, after having hit against the entrance of the membranous portion, the explorator is withdrawn about two or three centimetres, and from three to six drops only are slowly injected, the instrument being left in place a few minutes.

Care must be taken to have the patient urinate before the operation. These instillations are repeated every two days. The solution used is 2 per cent., rarely as high as 4 per cent.

VAGINITIS.

The local antiseptics are indicated in this affection, which is often accompanied by vaginismus. They are generally applied by a tampon soaked in the medicament and allowed to remain in place from twelve to twenty-four hours.

M. Dujardin-Beaumetz prescribes:

Gurjun balsam..... 1 part.
Lime-water..... 2 parts.

(Applied by tampons soaked in the solution and allowed to remain in place twenty-four hours.)

Injections are also made with chloral or with permanganate of potash—of the former, 20 grammes to 200 grammes of water; of the latter, 15 centigrammes to a pint of water.

The following is also recommended:

Tincture of iodine	20.0 to 40.0
Iodide of potassium	q. s.
Distilled water	1000.0

Also:

Salicylic acid	1.0
Alcohol, 90-per-cent	10.0
Distilled water	100.0

A tablespoonful in a quart of cold water for one injection.

Sulphate of iron may also be used (10 grammes per half-litre [1 pint] of water).

A tampon soaked in retinol and left in place from twelve to twenty-four hours succeeds very well and causes no pain (Balzer).

BALANITIS.

If the emollient lotions and boric water do not suffice in this affection, a dressing may be made with powdered oxide of zinc, either dry or in suspension in retinol. Calomel may also be used, or a solution of lead acetate by means of pledgets used in dressing.

In graver cases it may be necessary to brush the parts lightly with argent. nitras, 1:50. Almost all the antiseptics have been employed in such cases.

The general and local treatment of syphilis will be indicated in the chapter on General Diseases.

CHAPTER V.

ANTISEPTIC TREATMENT OF DISEASES OF THE LOCOMOTOR APPARATUS AND OF THE NERVOUS SYSTEM.

DISEASES OF THE LOCOMOTOR APPARATUS.

Although a certain number of the diseases classed under the title of *Diseases of the Locomotor Apparatus* * are manifestly consecutive to affections of microbian origin, the antiseptic treatment of these diseases has advanced too little to render possible separate methodical treatment for all.

In these affections the physician will content himself in endeavoring to effect general and intestinal antisepsis, and will treat the secondary complications conformably to the rules previously formulated.

Rheumatism is ordinarily considered as a general disease. We shall, however, treat it here, because the most recent researches seem to indicate that diseases of infectious nature due to the presence in the blood of various species of microbes are often clinically confounded under the name of rheumatism. At the same time, in the actual state of our knowledge respecting this subject, it is not possible to separate

* Progressive muscular paralysis, and progressive muscular atrophy (myopathic atrophy).

the different antiseptic treatments applicable to the different forms of rheumatism.

RHEUMATISM.

It is known that certain manifestly infectious states (local suppurations, puerperality, blennorhagia, scarlatina, mumps, dysentery) are accompanied or followed by morbid determinations to the joints and serous membranes which clinically resemble acute articular rheumatism of pronounced form due to the influence of cold and dampness (*secondary rheumatisms*, or *pseudo-rheumatisms*—Dieulafoy).

It is but a step further to admit that idiopathic rheumatism itself is a microbian disease, and it may soon be so proved.

In two cases of acute or subacute articular rheumatism, both of which terminated in fatal nephritis, Cornil and Babes* found the kidneys filled with bacteria, manifestly the cause of the polyarthritis and of the nephritis. Observations of this nature are every day becoming more numerous since the histological and bacteriological examination has become the necessary complement of autopsies.

Without denying the influence of cold and dampness—which evidently act here as a determining cause by paralyzing the cutaneous emunctory and causing the retention in the blood of substances ordinarily eliminated by the perspiration and urine (uric and

* "Les Bactéries," third edition, I, p. 530.

lactic acids, salts of lime, etc.)—it is probable that in many cases, and particularly in the most grave cases which resist rational treatment or terminate fatally, there is reason to assume the presence of a microbe which transforms a simple dyscrasia into an infectious disease. M. Bouchard considers that *chronic deforming rheumatism* is an affection amenable to antiseptic therapeutics, and one which "includes many diseases, the beginnings of which are different." The treatment here is the touchstone of diagnosis, and the good effects of intestinal or general antisepsis are proofs of the microbian nature of the affection (Bouchard).

Antiseptic Treatment of Rheumatism.—The heroic, almost specific, medicament for acute articular rheumatism is salicylate of soda, which is administered in solution according to the following formula (Dujardin-Beaumetz):

Salicylate of soda.....	15.0
Distilled water.....	250.0

A tablespoonful contains about one gramme (15 grains) of the salicylate. This dose may be repeated every four hours. When the pain ceases, two to three grammes only per day are given during a fortnight.

M. Bouchard associates with salicylate, bicarbonate of soda in doses of 10 grammes (150 grains) per day.

The urine should always be examined for albumen, which, if present, contra-indicates salicylate of soda. Careful surveillance must be had also of the

condition of the brain of the patient, so as to avoid all danger of poisoning by this medicament. Moreover, it should not be administered during pregnancy.

When the salicylate is contra-indicated—that is, if the patient is suffering from Bright's disease—M. Bucquoy replaces it by sulphate of quinine, antipyrine, or Dover's powder, while Dujardin-Beaumetz gives exalgin and phenacetin. The latter authority is at present experimenting with naphthol-β associated with the monosulphate of calcium, which renders it very soluble. In doses of 25 centigrammes per day this combination gives good results in rheumatism.

Even in children of over ten years, it is necessary to give at the onset large doses of salicylate of soda (6 grammes — 3 jss — during the day) in doses of one gramme (15 grains), either in capsules or spirit solution (wine and water). Doses of two to three grammes per day have no effect whatever. If this medicament, taken in capsules, is poorly supported by the stomach, Vichy water aids its toleration. In patients under ten years, three to four grammes are given daily; in patients under six years, two to three grammes.

M. Chauffard gives preference to antipyrine in doses of four to five grammes per day. This medicament never gives rise to the painful cerebral effects which sometimes follow the administration of the salicylate. To moderate the diaphoresis produced by

antipyrine, several granules of the neutral sulphate of atropine may be given. To this may be added the milk diet and diuretic drinks.

When salicylate is contra-indicated (nephritis, pregnancy, cardiopathy, etc.), M. Barth gives sulphate of quinine and antipyrine associated according to the following formula:

Sulphate of quinine..... 0.50
Antipyrine..... 0.50
(For one capsule—To be taken *post cibum*.)

According to M. Faisans, the efficacy of salicylate in idiopathic rheumatism is the touchstone of diagnosis. When this medication does not produce good results it is because there is some specific or pyæmic infection localized in the joints, and not true rheumatism.

In blennorrhagic rheumatism, M. Besnier prescribes the iodide of potassium as soon as the discharge has ceased. It is indispensable to immobilize the affected joints—a practice always the rule, and especially so in secondary rheumatism. If necessary, above all when the affection is fixed in one or more joints, the physician will apply revulsives (tincture of iodine, punctiform cauterizations).

The iodide of potassium, or the syrup of iodide of iron (a dessertspoonful twice a day for a fortnight, at meal time*), is administered by J. Simon in chronic rheumatism of children.

*The dose of the English syrup would not exceed twenty to forty minims.

The iodide of lithium is prescribed by M. Huchard in doses of twenty-five to fifty centigrammes (four to eight grains) per day in gout, a disease also treated by others with salicylate of soda.

Tetanus will be treated in the chapter on General Diseases.

DISEASES OF THE NERVOUS SYSTEM.

The antiseptic treatment of these diseases reduces itself, in general, to the treatment of the multiple complications of the digestive, circulatory, and respiratory apparatus, etc. Thus it is that in the neuroses, and in particular in neurasthenia, it will often be necessary to practice intestinal antisepsis conformably to the rules which have been laid down under the head of "Dyspepsia and Dilatation of the Stomach."

Meningitis should be regarded as a microbic disease, capable of being produced by different microbes. Under the collective name meningitis are grouped all the divers inflammations of the meninges (pia mater and arachnoid) which are produced, especially in children, under the influence of various causes. We designate more particularly under the name *acute meningitis* the inflammation caused by a traumatism, sunstroke, excess of mental work, etc. We call the meningitis *secondary* when it is consecutive to a suppuration local or general, otorrhœa, otitis, caries of the cranial bones, erysipelas of the face, rheumatism, syphilis, pyæmia, endocarditis, pneu-

monia (pneumococcus-meningitis), eruptive fevers, typhoid fever. Lastly, *tuberculous meningitis* is the most grave of these affections of microbic origin. The clinical differentiation of these various forms is difficult to make from the onset, despite the importance of an accurate diagnosis from the point of view of prognosis. We know, in fact, that while tuberculous meningitis is almost always fatal, recovery from the other forms is by no means impossible. In the absence of the bacteriological examination, the practitioner will rely chiefly on the antecedent history and the commemorative signs. Moreover, the treatment of the different forms is nearly the same, and in this affection, as in pleurisy, success may be considered as the touchstone of diagnosis; in other words, *the meningites not tuberculous are alone curable.*

General Treatment.—The obstinate constipation should be earnestly combated. Calomel acts as a purgative and an antiseptic. Give every four hours a powder consisting of one-tenth of a grain of calomel with two grains of rhubarb; this treatment to be pursued till free purgation ensues. The iodide-of-potassium treatment has considerable repute. One grain of iodide of potassium is given three times a day in syrup and water. The *Sirop iodo-tannique* is a good form in which to give iodide of potassium to children.

℞ Iodine..... 2.0
Extract of rhatany..... 8.0
Sugar and water, q. s. to make 1 kilogramme of syrup.
M. Dose, a tablespoonful twice a day.

Dujardin-Beaumetz gives sulphate of quinine from the onset; he prefers the subcutaneous injections of bromhydrate of quinine (1.50 grammes in the twenty-four hours).

Antipyrine in grain doses to young infants acts as a calmative and antiseptic.

Intestinal antisepsis by means of naphthol or benzonaphthol may be indicated.

Local Treatment.—This treatment consists in the application of medicaments at once antiphlogistic and antiseptic to the shaved scalp. Revulsives are to be eschewed; the ice-bag is the preferable treatment. Cold has here a probable antiseptic action. Tartar-emetic ointment (Descroizilles) is of very doubtful efficacy. The same may be said of Roger's belladonna-mercurial ointment (mild mercurial ointment, 5 parts; ext. belladonna, 1 part), with which he makes inunctions to the scalp and behind the ears. There has lately been some good English testimony in favor of a similar use of iodoform ointment (10 to 25 per cent. of iodoform) applied to the shaved head.

CHAPTER VI.

THE ANTISEPTIC TREATMENT OF GENERAL INFECTIOUS DISEASES.

I shall include under the above head the following diseases: Smallpox and varicella, measles and rubella, scarlet fever, erysipelas, mumps, typhoid fever, typhus, epidemic cerebro-spinal meningitis, cholera, yellow fever, sweating sickness, influenza, canine rabies, tetanus, malaria, and syphilis.

VARIOLA AND VARICELLA.

We find in the pustules of variola, in the blood of the portal vein, and in the liver and kidney of individuals affected with this disease, microbes of several species (*Micrococcus*), and notably the *Pasteurella Hlavai*, the *Streptococcus pyogenes*, and the *St. variolæ* (Cohn). According to Pfeiffer, some of these pretended micrococci, which no one has yet succeeded in cultivating artificially, are sporozoa, similar to those of malaria. However this may be, the infectious nature (inoculable and contagious) of the disease is admitted by all authorities. The antiseptic treatment *intus* and *extra* is, then, formally indicated.

Internal Treatment.—General and intestinal antisepsis may be made with naphthol or betol, or with benzonaphthol, according to the indications.

In the secondary fever of suppuration of grave

confluent variola, M. Audhoui gives the following potion:

Phenic acid.....	1.0
Syrup of cinchona.....	30.0
Syrup of acacia	120.0

M. Dose, a tablespoonful every hour.

[This would be equivalent to about one grain of concentrated phenic acid every hour; the vehicle might be acacia syrup, flavored or not with wintergreen and other aromatics.—Tr.]

In hæmorrhagic smallpox, M. Descroizilles gives sulphate of quinine in 2-grain doses every four hours. M. DuCastel gives full doses of perchloride of iron. Salicylic acid and salicylate of soda have also been given, and benzonaphthol when there was a complication of nephritis.*

Local or External Treatment.—The antiseptic treatment of the vesicles of smallpox presents a question of great importance, as much from the point of view of the general course of the affection, as from that of the cicatrices consecutive to the ulcerations of the derm.

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*It will be seen that there is really no internal antiseptic treatment for variola that can much modify this disease.—Tr.

Gueneau de Mussy counsels the following ointment:

Tannin Oxide of zinc	} ää	2.0
Calomel		0.25
Ext. opii		0.10
Simple cerate		30.0

For local application.

M. Descroizilles prescribes the following:

Collodion	40.0
Castor oil	4.0

M. For local application to the vesicles.

Or, in the more grave cases:

Glycerin	10.0
Soap	20.0
Ung. hydrarg	40.0

M. For local application to the vesicles.

Corrosive-sublimate-vaselin (1 to 5 per cent.) may be applied to each pustule separately by means of a little pledget of wadding, the operation being repeated three times a day or even oftener.

Talamon has formulated much more precisely the treatment of smallpox pustules. This is his method: Make ethereal antiseptic pulverizations—with salol if the disease is mild, with corrosive sublimate if the eruption is *coherent-confluent* (not primarily confluent). There is no better spray-solution than the following:

Corrosive sublimate Citric acid	ää.....	1 Gm.
Alcohol.....		5 c.c.
Ether.....	q. s. to make	50 c.c.

Spray with this solution three or four times a day to complete desiccation.

The duration of the sprayings is variable: it is customary to stop when the stratum of corrosive sublimate deposited begins to whiten the pustule (this result is obtained at the end of about a minute). In hæmorrhagic or *primarily confluent* smallpox these pulverizations are useless or contra-indicated, but they arrest the evolution of the vesicles in the abundant or coherent-confluent forms.

A quarter of an hour after the spraying, the nurse will cover the patient's face with a layer of the following ointment, using for this purpose a pledget of cotton-batting, and rubbing in briskly:

Corrosive sublimate.....	1.0
Glycerite of starch.....	15.0

After the fourth day the nurse will make only two pulverizations a day, while continuing the application of the ointment as before. The sprayings to be discontinued on the sixth or seventh day.

When the crusts are detached, the physician will substitute for the glycerite-of-starch ointment, borated vaselin, and will give the patient sublimate baths (one ounce of corrosive sublimate being dissolved in the water of a full bath).

The eyes are frequently washed in warm boric water. The eruptions of the mouth and throat are treated by antiseptic irrigations and gargles frequently repeated. Every two hours the nurse will paint the mucous membrane of mouth and fauces with a mixture of equal parts of salol and glycerin.

Varicella, an attenuated form of variola, is to be treated according to the same principles, but with less rigor. Salol-vaselin or sublimate-vaselin will suffice to arrest the evolution of the vesicles and prevent any ulceration of the derm which might cause cicatrices.

I may remark here that vaccination has been employed with success at the very onset of smallpox, as a means of attenuating the manifestations of this disease, and notably the cutaneous eruption which is so dreaded on account of the consecutive cicatrices.

MEASLES AND RUBELLA.

The microbes which have been found in the papules and in the pulmonary secretions of measles have been described by Babes, and characterized under the name of *Streptococcus morbellosus* by Trévisan. More recently, LeBel found in the urine of children affected with measles a bacillus which he has been able to cultivate, but with which he could not inoculate animals as Babes had done with the streptococcus.

We know that this disease is grave only by reason of the pulmonary complications (bronchitis, pneu-

monia) which often accompany it. The treatment is that of the complications, which, rest in bed or in one's room, and careful hygienic measures, will generally ward off.

Dieulafoy treats malignant measles by baths at 26° C. (78° F.) for twelve minutes, with cold affusions on the head. These baths are repeated every four or five hours till the temperature falls to about 38.5° C. (101° F.), and till the secretion of urine is restored. The skin becomes supple, and the eruption grows paler but pursues its course.

Rubella (German measles) is an attenuated form of rubeola, and presents no special indications.

SCARLATINA.

The microbe considered as the producer of this disease is the *Perroncitoa scarlatinosa* (Trévisan), a transversal diplococcus, *i.e.*, with cells articulated two by two so as to form a double chain. At the same time, in grave cases we find constantly in the organs the *Streptococcus pyogenes;* and Cornil has been led to suppose, by reason of the constant presence of this micro-organism in the grave forms of exanthematous fevers, "that certain known pathogenic microbes, having acquired in particular conditions of environment a special virulence, have the faculty of producing the eruptive diseases." It is possible also that these diseases are constituted by *microbian associations.*

The antiseptic treatment has especially for its

object the benefit of the nephritic complication which is so frequent in this disease. The daily examination of the urine will be a useful guide.

M. Descroizilles gives carbonate of ammonia in grain doses in syrup and peppermint-water.

H. Roger, to combat the nephritis, prescribes the following potion:

Tannin.....	0.20 Gm.
Tinct. aconite.....	10 drops.
Syrup of acacia.....	100 Gm.

M. Sig.: A dessertspoonful every two hours.

Paint over the region of the kidneys with tincture of iodine, or apply a flannel wrung out of hot water containing spirits of turpentine.

Give twice or three times a day a little sweet spirits of nitre with syrup of squills and digitalis:

℞	Spts. eth. nit.	f ʒ ij.
	Syrup. scillæ.....	f ℥ iij.
	Tinct. digitalis.....	f ʒ j–ij.

M. Dose: A teaspoonful three times a day.

Fuchsin in capsules may render service, but it is necessary to insist on vapor baths, especially if there is anasarca, in order to make up for the renal insufficiency and favor the reëstablishment of the functions of the kidneys.

Scarlatinal angina is best treated by irrigations of borax or salol, or gargles of borax. Chlorate of potash in 2 to 5-grain doses is in very general use.

[Phenic acid sprays cannot be too highly recommended:

℞ Acid carbolic, fort..... 2½ parts.
Borax..... 7 parts.
Glycerin ..... 10 parts.
Lime-water..... 90 parts.

For a common spray atomizer.—TR.]

Milk diet from the onset often suffices to prevent renal complications. In grave cases, cold baths may be used, as recommended in the treatment of malignant rubeola.

ERYSIPELAS.

The microbe of this affection (*Streptococcus erysipelatis*) is probably only a variety of the *Streptococcus pyogenes*, the pus microbe. The cultures of the two microbes are identical.

The treatment of this disease should be both general and local.

The *local* or *external treatment* is the more important from the fact that it is possible by antiseptic dressings to localize the inflammation of the skin to the point first affected, and to trace in some sort a line of demarcation which in most cases will not be overleaped by this inflammation. We thus reduce an affection which only becomes grave by its extension, to the proportions of a simple phlegmon.

A great many antiseptics, notably phenic acid, corrosive sublimate, and salicylic acid, have been employed for this end.

Verneuil sprays the part with a 3-per-cent. phenic acid solution.

Hallopeau employs salicylic acid (solution $\frac{1}{20}$) or salicylate of soda. A mask of linen cloth folded in several thicknesses is soaked in a solution of the sodium salicylate ($\frac{1}{100}$) and applied to the face or other part affected; this is covered with oiled silk to prevent evaporation. The result is very satisfactory; the swelling and tension of the skin diminish and disappear, and, even when the eruption spreads beyond the mask, the pain is much less great and the cerebral symptoms much less intense.

Talamon sprays the following solution over the limiting zone of the erysipelas and a little beyond the swelling, the procedure lasting one minute:

Hydrarg. bichlorid. }		
Acid, tartaric }	ää.....	1 Gm.
Alcohol.....		5 c. c.
Sulphuric ether.....q. s. to make		100 c. c.

This solution being caustic, it is necessary to protect the eyes, nares, and lips. These pulverizations should be repeated two or three times a day. Employed from the beginning, this treatment will bring on resolution by the fourth day.

In cases of feeble intensity, the medical attendant will content himself with dressings of salicylate of bismuth in powder (Marc Sée).

Internally sulphate of quinine and salicylate of soda may be given alternately, with a day of interval

between, or salicylic acid may be administered in doses of 20 grains three times a day, provided there are no cerebral accidents or dyspnœa.

As general antiseptics, naphthol and benzonaphthol may render service in this disease.

MUMPS.

By its epidemic and contagious nature, and its mode of evolution, this disease resembles the eruptive fevers, and must be regarded as an *infectious parotiditis*, produced by a special microbe which has not yet been isolated.

Bouchard gives the following potion:

Phenic acid		0.50
Sulphate of quinine Salicylic acid	} ää	2.0
Rum		125.0

M. Dose: A tablespoonful every hour till all is taken.*

Emollient applications of camphorated oil or glycerite of starch, with the addition of opium as there seems to be indication, suffice for the external treatment.

TYPHOID FEVER.

The microbe of this disease is probably the *Bacillus typhosus* of Eberth.

There are few diseases in which rigorous intes-

* These doses seem unnecessarily large in so mild a complaint as mumps.—Tr.

tinal antisepsis is more plainly suggested, by reason of the ulcerations which are seated in the walls of the intestine.

According to Bouchard, there are four indications to fulfill: general antisepsis, intestinal antisepsis, antipyretic medication, lastly regimen. He begins by a saline purgative; then gives calomel—in the dose of 40 centigrammes (about six grains) a day, in twenty doses—for four days, taking care to avoid salivation. He gives quinine only when the temperature exceeds 104° F. in the morning and 105° F. in the evening; then he gives 2 grammes (30 grains) daily during the first and second week, then 1½ grammes (22 grains) during the third, then 1 gramme (15 grains) only, taking care not to give another dose till after seventy-two hours. General baths at 38° C. (100° F.), cooled by degrees down to 30° C. (86° F.), and repeated eight times in the twenty-four hours, are only contra-indicated when there is intestinal hæmorrhage or pulmonary hepatization. Beef peptones for nourishment, and glycerin (six to seven ounces per day). Vegetable acids under the form of lemon-juice.

For intestinal antisepsis, Bouchard prefers naphthol α, which he administers under the following form:

Naphthol α Salicylate of bismuth	ää 5 Gm.

M. Div. in chart. No. x. Sig.: Take one powder every hour.

Benzonaphthol, recently introduced into therapeutics, may be substituted with advantage for naphthol, especially if the kidneys functionate badly. In the latter case, it is well also to avoid salicylate of bismuth.

Dujardin-Beaumetz has long employed the bisulphide of carbon as an intestinal antiseptic in typhoid fever. He now prefers beta-naphthol, betol, and benzonaphthol.

Jaccoud employs alcohol associated with extract of cinchona, and, occasionally, acetate of ammonia. In the most grave cases he gives hydrobromate of quinine, 7½ grains every quarter of an hour till four doses are taken, beginning eight hours before the febrile exacerbation.

Hertz prescribes salol associated with salicylate of bismuth, in the dose of 4 grammes (3 j) a day.

TYPHUS FEVER.

Typhus exanthematicus appears to be produced by a specific *streptobacillus* studied by Hlava, and which is found in the blood, not in the organs.

This disease, rare in France, is treated conformably to the rules of internal and general antisepsis: evacuants at the onset, then quinine, alcohol, naphthol, and benzonaphthol.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

By its course and its epidemic nature this disease resembles the general infectious diseases. The mi-

crobes of various species met with at the autopsies have been studied by Cornil and Babes, and by Leyden. The species most frequently found is the lanceolated microbe of Pasteur.

The antiseptic treatment does not differ from that of meningitis, apart from the symptomatic and prophylactic indications proper to epidemic meningitis.

General antisepsis may be carried out.

CHOLERA.

This disease is produced by the *Spirillum choleræ Asiaticæ* of Fluegge, designated by Koch under the name of *comma bacillus*.

Hayem considers the lack of acidity of the gastric juice as one of the principal predisposing causes of the disease, and prescribes lactic acid in doses of four to six grammes (3 j–jss) a day as a prophylactic means, and in doses of ten to twenty grammes (3 ijss–v) as a curative measure when the disease is declared. In bad cases he makes intravenous injections of common salt 175 grains, with 150 grains of sulphate of soda, to the quart of distilled water.

The new antiseptics, naphthol, betol, salol, benzo-naphthol, have not yet been tried, at least in France.

The tonic and supporting treatment is still as necessary as ever.

In cholera infantum (which seems to be due to a microbe different from that of Asiatic cholera) Jules Simon prescribes the following potion:

℞ Salicylate of bismuth..... 4.0
Prepared chalk..... 2.0
Tinct. canella..... 1.0
Peppermint-water..... 10.0
Malaga wine..... 10.0 to 30.0
Syrup acacia..... 100.0 to 120.0
Paregoric elixir. ..... 10 drops.
M.

The dose of the above would be a teaspoonful every hour.

YELLOW FEVER.

This disease is produced by the *Bacillus amarylloe* (Trévisan), which has been studied by Cornil and Babes, and is found in the liver and kidneys of persons affected with this disease.

Yellow fever ought to be treated according to the rules of intestinal antisepsis in general. Purgatives, acidulous and gaseous drinks (champagne), quinine, etc., are the means thus far employed to combat this affection.

THE SWEATING SICKNESS.

This disease, still incompletely studied, epidemic but not contagious (?), is probably of microbic origin. It is quite common in certain regions of France, where it is associated with the eruptive and malarial fevers. Cold lotions, tonics, quinine, and ipecac, are the means thus far employed; repeated cold-water lotions, vinous lemonade, sulphate of quinine, dry cups to relieve the oppression.

EPIDEMIC GRIP: INFLUENZA.

The specific microbe of influenza was described first by Babes, then by Seifert, and more recently by Pfeiffer. It is the *Streptococcus Seiferti*, and much resembles the *Streptococcus pyogenes*, according to Babes, but ought to be considered as a true bacillus. It is found almost always associated with the *Staphylococcus aureus* and the *pneumococcus*, in the sputa of patients affected with the "grip."

Dujardin-Beaumetz recommends the following treatment:

Neuralgic Form.—Give analgesin or exalgin in rum or some other alcoholic potion, in the dose of two to three grammes per day. Or give phenacetin in capsules of 15 grains twice a day.

Gastro-intestinal Form.—Here the reliance must be on preparations of opium, *e.g.*, paregoric in 10-drop doses three times a day—constipation and diarrhœa being combated by appropriate laxatives or antiseptics (salicylate of bismuth, betol, naphthol, benzonaphthol).

Catarrhal Form.—Give 5 grains of quinine morning and evening; this may be associated with 15 grains of analgesin or 10 of phenacetin. The dose of quinine may be varied from five grains to twenty grains.

Aconite is sometimes useful in the acute attack. One or two drops may be combined with a fluid-drachm each of syrup of Tolu and cherry-laurel water,

and given every four hours. If the patient is much depressed, make subcutaneous injection of caffeine twice or three times a day:

Caffeine Benzoate of soda	} ää.....	2.50 Gm.
Distilled water.....q. s. to make 10 c.c.		

M. [Each syringeful contains 0.25 of caffeine.]

CANINE RABIES.

The specific microbe of this disease is not yet known, nor does there seem to be any general antiseptic treatment. The inoculation of the virus attenuated by culture, according to Pasteur's method, is the sole method of cure yet recognized. The local treatment of the wound consists in cauterizing it with the hot iron; the chemical caustics are insufficient. The excision of a considerable portion of the soft parts bitten (skin, connective tissue, muscles) may be demanded.

TETANUS.

This affection seems to be due to the presence in the blood of the microbe (*Pacinia*) of Nicolaier, of which the germs are found habitually in vegetable mould. The inoculation takes place under the skin by a solution of continuity often almost invisible.

According to the recent researches of Vaillard and Vincent,* this bacillus acts by a very active toxine similar to that of the microbe of diphtheria, *i.e.*, having

* Annales de l'Institut Pasteur, 1891.

the chemical characters of the diastases. It is a poison at first muscular, then having an elective localization in the spinal cord.

According to experiments made by these two observers, it is noteworthy that the bacillus does not seem capable of itself of producing tetanus; it needs besides a predisposing condition, such as a traumatism, the presence of lactic acid, or of another microbe, such as the *Microbacillus prodigiosus*. Now several species of microbes abound in the soil.

The presence, in the tissues, of lactic acid and the toxine peculiar to the microbe, destroys phagocytosis, which in the physiological state can of itself prevent the disease, as the leucocytes engulf the microbes and their spores and annihilate their toxic products (Vaillard and Vincent).

In accordance with the etiology of this disease, we see the importance of seeking, at the very onset of the accidents, for the least solutions of continuity of the derm, and of treating them by the local antiseptics. The antiseptic dressing of accidental or operative wounds, to-day practiced by the majority of physicians and surgeons, ordinarily guarantees the patient against this complication. [The treatment of tetanus by subcutaneous injection of blood-serum from animals immune to the disease, has given some encouraging results. This serum contains certain antitoxines which have in numerous instances proved curative when the disease has been fully established.

Schwartz, in *La Semaine Médicale* for April 5, 1893, reports two cases recently occurring that seemed to owe their recovery to these injections. An injection of 50 c. c. of the serum is a medium injection. This treatment, under proper antiseptic precautions, seems to be safe.—TR.]

MALARIA.

The intermittent or marsh fevers have for their causative factor a micro-organism which, unlike most other pathogenic micobes, is not a vegetal of the family of bacteria, but an animalcule of the group of *Sporozoa*, designated under the names of *Hæmogregarina malariæ*, *Hæmatophyllum malariæ*, or *Laverania malariæ*, the latter name being given in honor of M. Laveran, who first discovered the parasite in the blood of malarial patients.

The antiseptic which is justly regarded as specific in this disease is quinine.

In the quotidian form the quinine ought to be so administered that the last dose shall have been given eight hours before the expected chill; hence it is convenient to begin the administration almost immediately after the preceding chill. This is Jaccoud's method.

In the tertian form, give the quinine twelve hours before the time for the chill.

In quartan ague, give it fifteen to eighteen hours beforehand.

The elimination of the remedy being rapid, you must bring near together the periods of administration of the fractions of the full dose required, in order to keep the organism well under the influence of the drug. If you decide that 15 grains is sufficient, you will give this quantity in three or four equal doses an hour apart.

Large doses (30 grains or more) are often necessary to bring about suppression of the attacks; this being accomplished, the doses can be reduced so that the daily quantity shall not exceed twelve grains, for a number of days.

In grave cases, when the stomach will not tolerate the medicine, you can give hypodermatic injections of quinine hydrobromate. Dissolve one part in five parts of distilled water, thus:

℞ Hydrobromate of quinine..... 1.0
Distilled water..... .... 5.0

M. Three or four injections per day.

The preparations of cinchona, and arsenic and its salts, are principally used in the chronic forms of malaria.

SYPHILIS.

This disease, infectious, contagious, and inoculable by way of wounds of every kind, is considered as produced by the presence in the blood, and consecutively in the cellulo-vascular tissue and the bones, of the bacillus discovered by Lustgarten, the *Pacinia*

syphilitica, a microbe whose specificity remains doubtful.

Save in congenital (hereditary) syphilis, it is admitted to-day that the starting-point of the syphilitic infection is always an inoculation of which the initial lesion is the indurated or infectant chancre. The soft (or simple) chancre does not give constitutional syphilis — which amounts to saying that it does not contain the specific bacillus of this affection, although it is equally of infectious or microbian nature. The microbe or microbes which produce it have not yet been sufficiently studied. It is probable that several species, notably those of pus, are associated here.

Local Treatment.—Whether we have to do with the simple chancre, or with the hard infectant chancre, the local antiseptic treatment is nearly the same.

Ricord employed the nitrate of silver (solution $\frac{1}{30}$), which brings about a cure in twenty-five to thirty days.

Iodoform may be expected to cure the chancre in about a week.

Salicylic acid is said to be still more active (Hebra). It is said to bring on cicatrization in four or five days. It is employed in fine powder, and covered with a thin layer of wadding. It should be renewed once or twice a day following the suppuration, and the sore washed every time.

Hot water, recommended by Aubert, of Lyons, under the form of prolonged baths (several hours), suffices in most cases.

Here are a few formulæ of ointments employed especially in indurated chancre:

℞ Iodoform 1.0
Balsam of Peru..... 3.0
Vaselin..... 8.0

M. For dressings. (Dujardin-Beaumetz.)

℞ Calomel } ää..... 2.0
Oxide of zinc }
Lanolin } ää..... 15.0
Vaselin }

M. For dressings. (Mauriac.)

If the chancre is *phagedenic*, you will, after having removed the scabs, dress it three times a day with wadding coated with:

Calomel..... 2.0
Cold-cream ointment..... 20.0

Or once a day with the following ointment:

Pyrogallic acid.....5.0 to 10.0
Vaselin 50.0

Or with the following when the sore granulates abundantly:

Chloral..... 1.0
Water..... 100.0

M. Sig.: To be used once a day as a lotion to the venereal ulcer. Powder the sore afterwards with subcarbonate of iron.

Terrillon also employs pyrogallic acid in phagedenic chancre:

℞ Pyrogallic acid..... 10.0
Starch powder..... 40.0

M For dressings.

According to M. Du Castel, the indurated chancre gets well of itself in a given lapse of time, and the local treatment has a rôle which is rather hygienic and prophylactic than curative. Instead of the irritant topical applications, he proposes powders of salol or cinchona.

Resorcin, corrosive sublimate, or phenic acid may be employed, according to the indications. It is sometimes advantageous to paint with the following solution:

Alcohol 20.0
Phenic acid..... 2.0

One painting a day for three or four days, rapidly transforms the chancre into a simple wound. Follow with a dressing of salol or aromatic wine.

General or Internal Treatment of Confirmed Syphilis.—This treatment is based on the employment of mercury or its salts, which have here an efficacy such that we may regard them as specifics. Iodine and the iodides are often associated or alternated with mercury.

Dujardin-Beaumetz has advised hypodermatic injections of chloropeptonate of mercury:

Peptone in powder Pure chloride of ammonium	} ää..	0.3
Corrosive sublimate		0.2
Glycerin		5.0
Water		15.0

M. [Each syringeful contains 1 centigramme of corrosive sublimate.] One injection every day or every two or three days.

Mauriac gives protoiodide in pills. Each pill contains one-half a grain of protoiodide of mercury, with one grain of quinine; three of these pills may be given daily.

The following syrup also is Mauriac's:

Biniodide of mercury	0.1
Iodide of potassium	5.0 to 20.0
Syrup aurantii cort	200.0

M. Dose: Two to three tablespoonfuls a day.

Give the maximum of the iodide in ulcerous syphilis.

Fournier remains faithful to the mode of administration of mercury by the skin, under the form of frictions of mercurial ointment. He begins by rubbing in 4 grammes (3 j) a day, and increases gradually to 8 grammes (3 ij). Women and especially children are most sensitive to these inunctions; in the latter, in the course of the first year, one to two grammes (15 to 30 grains) a day will suffice. The

ointment is left in place eight to ten hours, covered with wadding and sticking-plaster; at the end of this time the region is washed with soap and water. The treatment is continued uninterruptedly three or four weeks.

Baths of corrosive sublimate, mercurial fumigations, etc., have also been employed in syphilis.

There are three periods in the systematic treatment of syphilis: *First*, that of local treatment of the chancres and buboes, if there are any; *second*, that of the mercurial treatment properly so called; (in the period of transition, the iodides and mercury are associated); *third* (tertiary period), that of iodide treatment alone.

The treatment of constitutional syphilis demands often three or four years. During this long space of time the prudent practitioner will institute the method of successive treatments, according to the directions of Fournier, with its stages of repose, called periods of *accustomance*.

CHAPTER VII.

ANTISEPTIC TREATMENT OF DISEASES OF THE SKIN.

General Considerations on the Nature of the Dermatoses.—A great number of cutaneous affections are directly produced by parasites, animal or vegetable, the destruction of which is the first therapeutic indication.

Among the first are the various forms of itch and phthiriasis, produced by arthropoda (acari or insects); then the *psorospermoses* (epithelioma and Molluscum Contagiosum, eczema of Paget, carcinoma, etc.), which appear to be due to the presence of animalculæ of the sub-kingdom Protozoa and of the class of Sporozoa (coccidia, etc.).

Among the second, we may place the *dermatomycoses*, affections produced by microscopic fungi of an order more elevated than the bacteria. Such are tinea favosa, tinea tonsurans, pityriasis capitis, porrigo decalvans, etc.

Other affections of the skin are considered as cutaneous manifestations of certain infectious or microbic diseases. Besides erysipelas, smallpox, measles, etc., which belong to general diseases, we may mention lepra, elephantiasis, lupus (produced by the *Bacillus tuberculosis*), the disease recently described under

the name of *perlêche*, furuncle, anthrax, the cutaneous manifestations of syphilis, etc.

In a large number of cutaneous eruptions, investigators have noticed the presence of bacteria of various species. Vidal has noted them in the pustules of ecthyma; Vidal and Gebier in the bullæ of pemphigus; Eklund and Lang in psoriasis; Babes in the pustules of prurigo. The latter is due to a streptococcus of particular species (*St. giganteus cutis*). In the sweat of the feet and of the armpits are found microbes considered as simply saprogenous, and not pathogenic like the preceding.

We know to-day that the cutaneous follicles, aside from any and every traumatic solution of continuity, may serve as a door of entrance to pathogenic bacteria whose germs float in the air and adhere to the garments or fingers. The fact has been proved experimentally in the case of furuncle. In all cases, scratching, the friction of the garments, and every irritant contact which inflames the skin, more particularly over the hair follicles, contribute to facilitate the inoculation of pathogenic microbes.

Even when this inoculation is not the immediate cause of a cutaneous eruption, and when we are obliged to seek for a double point of departure of the latter—both in a constitutional dyscrasia and in a local irritation purely traumatic—it is necessary to guard against the complications due to the presence of microbes, and particularly those that always ac-

company suppuratious (*Streptococcus pyogenes* and *Staphylococcus pyogenes*).

Every pimple is a weak point where the inflamed skin loses its protective epithelial covering, and may become a door of entrance for the pyogenic microbes. Moreover, when these pimples (papules, vesicles, pustules) communicate more or less freely with the exterior by suppuration or by the simple serous exudation which accompanies the cutaneous œdema, they become veritable foci of microbic cultures. These bacterial cultures are the principal obstacle to the cure, for they foster the local phagocytosis and diapedesis, and oppose the cicatrization and *restitutio ad integrum* of the epithelial coat.

These considerations suffice to explain why the local antiseptic treatment is so obligatory in most diseases of the skin, and why the other treatments remain inefficacious when this is neglected.

A general antiseptic treatment must also be carried out. We know the strict relations which exist between the functions of the mucosa of the gastro-intestinal tube and the functions of the skin; a great number of the cutaneous affections have their starting-point in lesions of nutrition (superabundant diet, alcoholism, renal lithiasis, diabetes, constipation, dyspepsia). In all these cases there will be occasion to effect general and intestinal antisepsis by the aid of naphthol, benzonaphthol, etc.

In the following review of the applications of

antiseptic therapeutics to the dermatoses, I shall be obliged to be brief, and shall give but a small number of formulæ. I shall begin by saying a few words about the treatment of wounds and burns, omitting the indications which belong particularly to the department of the surgeon.

WOUNDS AND BURNS.

Burns, cuts, and solutions of continuity of the derm may, when of little extent, heal by first intention without suture and without ligature. To aid in this process, we employ adhesive plasters and collodion. Perfect cleanliness is the first requisite; asepsis at the first insures ultimate antisepsis. The wound is first washed with boiled water or boric or carbolic water, and the physician will use, not a sponge which may be foul, but a wad of antiseptic absorbent cotton. Every foreign body must be removed from the wound. Diachylon plaster should be eschewed; it is never fresh and is likely to be septic, besides it is irritating to the wound and to the skin. The English *emplastrum adhesivum* is not much better, and certainly adheres badly. The ricinated collodion, the collodion-goldbeater's skin, the gummed collodion and isinglass plasters, the artificial *baudruche*, are more useful. Flexible or ricinated collodion, alone or with the addition of iodoform or salol, is employed in the form of an ethereal solution which is easily painted over the part with a camel's-hair pencil. On the

evaporation of the ether it forms a thin, firm pellicle which adheres with much tenacity to the part and makes an admirable protective coat; it cannot easily be washed off with water, hot or cold. The gold-beater's skin and isinglass plasters make also an excellent agglutinative dressing; they may be applied dry to the skin which has been moistened with an aseptic liquid, and several layers of collodion may then be painted over the dressing to render it more resistant.

The old-fashioned treatment of burns by carron oil and cotton batting is liable to cause extensive suppurations and vicious cicatrices. The cotton batting sticks to the tissues and is not easy of removal, and, unless it be made antiseptic by corrosive sublimate or iodoform, is almost sure to entail suppuration. With the transparent *baudruche* (gold-beaters' skin) there is nothing of this kind to fear. Phlyctenæ are to be punctured and covered with isinglass plaster. In numerous cases of burns of the face I have obtained excellent results in this way. A favorite method of treating extensive burns involving destruction of the epidermis, is by means of borated vaselin applied on strips of linen or gauze. Wall's ointment consists of 1 part cocaine, 16 parts salol, and 120 parts vaselin. The seat of the injury is first irrigated with boric water or Van Swieten's solution diluted with as much boiled water.

FORMS OF APPLICATION OF TOPICAL AGENTS IN DISEASES OF THE SKIN.

Since the good effects of antiseptic therapeutics have been recognized, fats of animal origin (lard and benzoated lard), which quickly become rancid, have been almost universally abandoned, being replaced by vaselin, glycerites, and glyceroles—chemical compounds of the same consistence, but with the advantage of not becoming rancid. Oils of vegetable origin ought to be sterilized, or replaced by products which, like retinol, are antiseptics of themselves and may serve as excipients to a great many active substances.

In many cases it is better to apply the topical agent in the form of a fine powder (calomel, iodoform, dermatol, etc.).

Lastly, in desperate cases, it is well to have recourse to sprays of antiseptic liquids. M. Besnier employs pulverizations (by means of a hand-atomizer) of corrosive sublimate, 1 to 1000, in eczemas and other dermatoses that have resisted all other forms of treatment.

ERYTHEMA.

In simple erythema we employ astringent lotions and dust the parts with absorbent powders. Tar ointments, oil of cade, calomel ointment, etc., are much used In children's *intertrigo* we employ mixtures of powder of talc and oxide of zinc, or boric acid and starch. In erythema nodosum, Vidal coun-

sels lotions of ammonium chloride (1:20), and gives internally quinine or salicylate of soda.

ECZEMA.

In acute cases use salicylic acid or oxide-of-zinc ointment with starch and lanolin. Brocq recommends a mixture of absorbent powders – oxide of zinc, bismuth subnitrate, starch—and ointments of boric acid, balsam of Peru, oil of cade, or yellow precipitate, according to the indications. The internal treatment will be that of the cause (salicylate of soda, of lithia, etc.).

Eczema of the anus demands paintings with nitrate of silver, with chloral, etc. If dry, it may be treated with a mixture of tannin and calomel in glycerite of starch.

Eczema of the beard is treated with ointments of precipitated sulphur, turpeth mineral, etc.; if there is sycosis, a plaster formed of a mixture of minium and cinnabar is employed.

In eczema of the face, Besnier employs a mixture of glycerite of starch with tartaric and salicylic acids, or subacetate of lead.

In eczema of the genitals, he uses an ointment of hydrated sulphide of zinc. Vidal introduces into the vagina a tampon soaked in gurjun oil and lime-water.

In chronic eczema, tannin, alum, subacetate of lead, sulphate of zinc, binoxide of mercury, and cor-

rosive sublimate (1 to 2 per 100) have been successively employed.

HERPES.

Fournier recommends the following powder:

Subnitrate of bismuth		4 parts.
Calomel	}	
Oxide of zinc	}	āā 1 part.

M.

In *herpes iris*, Vidal employs for the buccal mucosa a collutorium of borax dissolved in glycerin and cherry-laurel water. To the mucous membrane of the eye he applies a warm and very dilute solution of Goulard's extract.

In genital herpes, if dry, lanolin and vaselin are used. If the herpes is moist, a powder is advised consisting of 1 part bismuth, 5 parts tannin, and 100 parts powdered starch; or the glycerite of tannin (1 part tannin to 40 of glycerin).

SCABIES: THE ITCH.

The treatment of this parasitic disease is well known; the acarus (*Sarcoptes*) which burrows in the derm must be killed by ointments of sulphur and carbonate of potash, salol oil, vaselin, and naphthol β, with ether added to dissolve the naphthol. Descroizilles uses lotions of zinc chloride; Constantin Paul, petroleum soap; Vidal, oil of styrax.

Before using ointments, see that the epidermis is softened by thorough scrubbing with soap and water.

PEMPHIGUS.

This disease is one of those that need internal treatment, and especially tonics (arseniate of iron, etc.). Evacuate the liquid of the bullæ with an aseptic needle, and dress with powdered cinchona bark or with salol, iodoform, dermatol, etc. If the ulcerations are exposed, dress, like burns, with liniment of lime-water and linseed oil, and cover with *baudruche* or antiseptic gauze.

RUPIA.

With the shedding of the crusts obtained by emollients, the medical attendant may have occasion to resort to the antiseptic caustics (nitrate of silver, acid nitrate of mercury) and ointments of protoiodide or biniodide of mercury to prevent the crusts from re-forming. The antiseptic dressing is here imperative. If the affection is syphilitic, give internally one of the iodides of mercury.

ACNE.

In the different forms of acne, we employ, according to the case, ointments of sulphur and naphthol, baths and lotions of sulphide of potassium, ichthyol (which acts as a siccative and by the sulphur which it contains), zinc oxide, salicylic acid, ammonium chloride, mercurous iodide (emplastrum Vigo), solutions of corrosive sublimate (Brocq and Besnier). Internal treatment is indispensable, as acne of the

face almost always comes from an affection of the stomach.

IMPETIGO.

Remove the crusts by emollients, and apply an ointment of glycerite of starch and boric acid.

When the acute stage is passed, employ a glycerole with tannin and calomel, or plasters with oil of cade and yellow precipitate, minium or cinnabar. This latter dressing, removed each day, is preceded by a lotion of camphorated alcohol diluted with water.

PRURIGO.

M. Besnier treats this affection with lotions o warm water medicated with a little aromatic vinegar and phenic acid. The part is then dusted with a powder of salicylate of bismuth and starch.

Gaucher applies lotions of chloral, phenic acid, corrosive sublimate. Quinquaud employs acids: crystallized acetic acid (1 to 2 per 100), monochlor-acetic acid (15 per 100).

Pruritus vulvæ may be combated by solutions of borax and morphine, by applications of powders of bismuth subnitrate and belladonna, or by lotions of corrosive sublimate.

ECTHYMA.

M. Vidal employs a mixture of cinnabar 1 part, minium 2 parts, diachylon 27 parts. This topical agent is very promptly siccative and promotes cicatri-

zation; at the same time it prevents the disease from spreading.

LICHEN.

Besnier treats this affection with hypodermatic injections of arseniate of soda very dilute and thrown deeply into the muscles.

Hardy gives arsenic internally, and employs ointments of oxide of zinc and camphor, or calomel and tannin, or, sometimes, of cyanide of potassium (one grain to an ounce of vaselin), to relieve the itching.

Vidal uses inunctions of oil of cade or glycerole of tartaric acid.

PSORIASIS.

Besnier employs a naphthol ointment, or frictions with a mixture of pyrogallic and salicylic acids dissolved in ether and alcohol.

It is possible to get rid of the diseased skin by baths and frictions; then the parts may be brushed over with a camel's-hair pencil charged with a solution of chrysophanic acid in chloroform (15 per 100), and the surface covered with gutta-percha dissolved in chloroform.

In buccal psoriasis, iodoform is employed in ointment with cacao butter. Pomades of ergotin, calomel, oil of cade, and mercurial ointment are also employed. In children, Simon prescribes arseniate of soda internally in chronic cases.

ICHTHYOSIS.

Descroizilles prescribes baths with starch, vapor baths, inunctions with glycerite of starch, and frictions with tar and vaselin (1 to 2 per 100) or oil of cade and sweet almonds. Lotions twice daily with glycerin and water (1 per 10).

DERMATOSES CAUSED BY MICROPHYTES OR PARASITIC FUNGI.

We know that tinea favosa is caused by the *Achorion Schoenleinii;* herpes circinatus or tinea tonsurans by the *Tricophyton tonsurans;* pityriasis versicolor by the *Microsporon furfur;* pityriasis simplex by the *Microsporon Malassezii;* porrigo decalvans by the *Microsporon Audouini.* All these microscopic fungi are of an organization more complex and more elevated than the bacteria. Their destruction demands a very energetic antiseptic treatment.

Tinea favosa, like tinea tonsurans or tricophyton, is very contagious and very difficult to eradicate; it demands a long and persevering treatment, whose first indication is to keep the hair clipped close with the scissors in order that the necessary antiseptics may be very thoroughly applied. Epilation is necessary around the patches.

Besnier employs lavages with black soap or tar, boric acid, sulphur and salicylic acid, etc.; then he treats the patches with *emplastrum de Vigo.*

Brocq employs sublimate lotions (1 per 400 of

water and 100 of glycerin). Morning and evening he makes frictions with turpeth-mineral ointment.

Luillier employs a mixture of corrosive sublimate and sal ammoniac in solution (Gowland's liquid).

Quinquaud, without practicing epilation, makes use of solutions of corrosive sublimate, and of bin-iodide and bichloride of mercury associated.

Vidal employs turpentine and tincture of iodine.

In herpes circinatus and sycosis, tincture of iodine and turpeth mineral are the agents most often used.

Pityriasis versicolor is treated by Besnier with an ointment made of sulphur, resorcin, and salicylic acid, applied each evening and removed in the morning. He sometimes resorts to corrosive sublimate.

Gaucher employs salicylate of soda and chloral in lotions. Vidal, turpeth mineral in ointment with castor oil and cacao butter. Dujardin-Beaumetz treats pityriasis of the hairy scalp with inunctions of the following:

Glycerin } āā New rum }	50.0
Tincture cantharides	10.0
Saturated solution of borax	1000.0

Besnier prescribes a decoction of saponaria or of quillaya applied in the form of a lather.

Gaucher applies a solution of chloral.

Porrigo decalvans may be treated with decoction of Panama wood, frictions being also made with such substances as acetic acid and chloroform, tincture of cantharides, iodized chloroform, hydrochloric acid, essence of turpentine, ammonia, etc.

CHAPTER VIII.

THE ANTISEPTIC TREATMENT OF THE DISEASES OF THE EYES.

Aside from the operations practiced on the eyes, and which can only be performed by trained specialists, there are certain superficial affections of these organs (conjunctivitis, blepharitis, etc.) which belong to every-day practice, and which every physician ought to know how to treat conformably to the rules of modern therapeutics. Most of these affections being of infectious and microbian origin, the antiseptics are here unmistakably indicated. Before stating the special treatment of these affections, I shall say a few words concerning certain antiseptics considered in a general manner from the point of view of ophthalmology.

General Considerations.—The 4-per-cent. solution of *boric acid* is most widely in use, but it is not the most efficacious of the antiseptics. Its absolute innocuousness is the only advantage which it possesses. But if from a wholly hygienic point of view it has some utility, we may say without hesitation that when the physician has to do with a conjunctivitis of any sort (conjunctivitis of new-born infants, purulent or even catarrhal conjunctivitis of moderate intensity) its antiseptic action is absolutely inappreciable and altogether insufficient, and that its employment really

constitutes a danger, in giving to the patient a false sense of security, and causing him to lose precious time while the affection spreads and passes to a chronic stage. It would be better far to consult a good specialist who would prescribe from the first an antiseptic treatment proportioned to the gravity of the affection.

These reservations being made, the saturated solution of boric acid (4-per-cent.), prepared with filtered and boiled water, may be employed preferably in hyperæmic conjunctivitis, in catarrhal conjunctivitis of feeble intensity (while watching with care the secretion), and in phlyctenular conjunctivitis (concurrently with the appropriate medication, *i. e.*, ointment of yellow oxide of mercury, 3 grains to the ounce). In all cases the practitioner will make use of a cold solution with which to wet his compresses, which must be applied to the half-opened eyes five or six times a day. Compresses soaked in the same solution *warm* should be employed in all forms of keratitis uncomplicated with infectious ulcerations and blepharitis.

Lastly, this solution may serve for eye-dressings after the section of the cornea in iridectomy, whenever there is reason to dread the dangers of corrosive sublimate solution (such as infiltration of the cornea—a rare accident which has been referred, but perhaps not with sufficient reason, to the use of mercurial collyria).

Surgical instruments, previously rendered aseptic

by soaking in alcohol or strong carbolic acid (substances which might irritate the eye in the course of an operation), may be kept in the boric solution prior to and during a surgical operation on the eye.

The solutions of *corrosive sublimate* used in ocular therapeutics ought always to be prepared with distilled water alone, without the addition of alcohol (a condition indispensable in order that this solution may be non-irritant, and in order to avoid infiltrations of the cornea). The solution most commonly employed is 1:2000. Ophthalmologists use it for wetting compresses to be applied in the same manner as the boric solution, in the ophthalmia of new-born infants, in purulent conjunctivitis, in intense catarrhal conjunctivits with muco-purulent secretion, in infectious ulcers of the cornea, in granular conjunctivitis, etc. You will watch the employment of this solution, and if any ill effects should appear on the part of the skin or cornea, you will dilute it with a third or half as much water; you will thus obtain a solution which, while being absolutely harmless, loses (it must be owned) the largest part of its antiseptic properties. The solution of corrosive sublimate is also employed in lavages and irrigations to remove the pus of the inflamed conjunctiva, and to render aseptic the field of operation in iridectomy, etc. Surgeons now use this same solution to moisten the little gauze balls which are employed instead of sponges during operations.

The solution of corrosive sublimate, on account of tarnishing the metals, cannot be used to disinfect instruments used in operations.

A solution of 1 to 500 is employed during curettage of the conjunctival granulations in trachoma.

Bear in mind that when you have recourse to anæsthesia of the eye by cocaine, you must drop in the anæsthetic before medicating the eye with the sublimate solution, for without this precaution the action of the cocaine will be considerably lessened.

Phenic acid (1: 125) is also employed as a feeble antiseptic in place of boric acid. Surgical instruments prior to an eye operation may be kept in a strong solution (25 to 50 per 1000), as in general surgery.

Biniodide of mercury, prepared according to the following formula:

Biniodide of mercury	0.05
Alcohol.....	20.00
Water.....	1000.00

is an antiseptic in general use, and one of the best for lavages, irrigations, disinfection of instruments, etc.

Cyanide of mercury in a $\frac{1}{100}$ alcoholic solution may serve for the disinfection of instruments; but as the eye tolerates alcohol very badly, the instruments must subsequently be soaked in a boric acid solution.

Iodoform and aristol in powder or ointment (1: 10) are employed in the treatment of ulcers of the cornea.

It remains to speak of nitrate of silver, which, although it is considered by most ophthalmologists rather as a caustic than as an antiseptic, none the less occupies the first rank in the therapeutics of eye affections. Moreover, it is a fact that, because of their action on the microbes, the caustics ought to be classed among the most energetic antiseptics.

In dealing with conjunctivitis in general, the antiseptic treatment such as has been above indicated is in reality insufficient, or can be considered only as preventive. It is necessary to add cauterizations, sometimes twice a day, with a solution of nitrate of silver (2:100). In the less grave cases these cauterizations may be resorted to at longer intervals—every two days—or they may be made oftener with weaker solutions, as 1-per-cent. or ½-per-cent.

To prevent the purulent conjunctivitis of the new-born, obstetricians counsel a sort of maternal prophylaxis (antiseptic vaginal injections before and during the accouchement); and some would extend this prophylaxis to the infant by bathing its eyes, as soon as born, with some antiseptic solution. Lemon-juice in instillations has been used for this purpose, as well as insufflations of iodoform powder. The latter is always well tolerated, and does not produce any inflammatory reaction.

Special Therapeutics of the Inflammations of the Eye.—To complete the notions which have

been stated, we shall indicate briefly the principal treatments in use in the hospitals in Paris to combat the inflammations of infectious nature which have their seat in the membranes of the eye.

CONJUNCTIVITIS.

Catarrhal conjunctivitis should be treated, as we have said, by instillations of nitrate of silver, and compresses wet in boric water.

Granular conjunctivitis has been most successfully treated by repeated touchings with crayons of subacetate of lead, sulphate of copper, or even mitigated nitrate of silver (the excess of silver salt is neutralized by bathing the eye with a little salt and water). To this you may add antiseptic douches (boric or carbolic water), or you may perform massage of the lids after the introduction of a little red-precipitate ointment. Insufflations of finely powdered iodoform may also be used.

Purulent conjunctivitis is treated by M. Budin with lotions of naphthol α (3 grains to one quart of distilled water), concurrently with cauterizations with nitrate of silver.

M. Kirmisson, after having rid the conjunctiva of pus by an antiseptic lavage, makes a cauterization with a solution of nitrate of silver ($\frac{1}{10}$ or $\frac{1}{30}$), or with the crayon mitigated one-third by the addition of starch. The excess of the nitrate is neutralized by a solution of common salt. The cauterizations are

made once or twice in the twenty-four hours. To this are added douches with an antiseptic solution, and in the interval the lids are covered with compresses wet with the same solution, and these are sometimes covered with a little bag of ice.

BLEPHARITIS.

Trousseau treats this affection by applying every hour compresses wet in the following solution:

Zinc. sulph.....	1 part.
Aquæ destil.....	100 parts.

Lavages with warm boric water are necessary to detach the concretions which form during the night at the base of the cilia.

An ointment of oxide of zinc and vaselin, 1 part to 10, may also do good service.

In the chronic forms we employ ointments of binoxide of mercury and acetate of lead, with a little oil of cade, tincture of benzoin, etc.

In the blepharitis accompanying pityriasis, Trousseau uses compresses wet in a solution of sulphate of zinc (1:100), applied morning and evening for ten minutes. During the night the border of the lids is smeared with a mixture of vaselin and lanolin, or with an ointment of red precipitate or the yellow oxide of mercury, resorcin, or phenic acid.

In ulcerous blepharitis he employs phenic acid or corrosive sublimate in weak solution, on warm compresses applied for one-half hour twice a day. To

this are added cauterizations with nitrate of silver (crayon or solution), or tincture of iodine if the ulcers are torpid.

In the blepharo-conjunctivitis of infants, Saint Germain and Valude use the following collyrium:

Sulphate of zinc	1 part.
Rose-water.....	50 parts.
Distilled water.....	150 parts.

KERATITIS.

Trousseau treats phlyctenular keratitis by introducing, by means of a camel-hair pencil, a certain quantity (size of a grain of wheat) of the following ointment:

Yellow oxide of mercury	0.25
Vaselin.....	5.00

Besides, compresses soaked in boric solution are applied three times a day for a quarter of an hour. The compresses may also be wet in chloral water.

Frictions over the orbit with mercurial-belladonna ointment, and cod-liver oil internally, complete the treatment. The patient is kept in a dark room, and complications are treated according to indications.

IRITIS.

Concurrently with instillations of atropine, warm compresses wet in the boric solution are applied three or four times a day. During the night the compresses are replaced by a wad of absorbent cotton.

Be sure to avoid exposure to cold, which exasperates the iritis.

Inunctions of mercurial-belladonna ointment will calm the pain; iodide of potassium will combat the exudations, and bromide or chloral the insomnia. In the suppurative form, give sulphate of quinine internally.

Treat the cause—syphilis, gout, rheumatism, etc. —with the appropriate medication.

CHAPTER IX.

ANTISEPTIC TREATMENT OF DISEASES OF THE THROAT, NOSE, AND EARS.

The antiseptic treatment of diseases of the nasal fossæ, pharynx, and ears, has made considerable progress during the last twenty years. Here, as in all other branches of the healing art in these days, the methods of exploration and of treatment are thoroughly subjected to the rules of antisepsis and asepsis.

Baths or irrigations, sprays or injections (nasal douche), serve to bring the different antiseptic liquids into contact with the nasal mucosa, and to wash away the pus, the microbes and all the products of inflammation which may sojourn in folds of the anterior or posterior nares. The procedures and apparatus devised for this end are described in all special treatises. Sprays constitute an excellent means for bringing the liquid in a finely divided form into contact with the mucosa, and are particularly useful in the treatment of children, who hardly tolerate the nasal douche. These are made by means of appropriate end-tips and cannulæ, by way of nose or mouth, according to indications. Camel-hair pencils, and sponge probangs with flexible stems, may be soaked in the same liquids and carried to the parts it is desired to medicate. Lastly, the fine impalpable powders are frequently employed, and may be projected upon the

part by means of suitable powder-blowers. The caustics may be used in the form of crayons or solutions.

The liquids employed for the baths and douches should be tepid.

The solutions employed for simple detergent washings are the common salt solution (1: 100) or weak solutions of bicarbonate of soda, chlorate of potassium, etc. The water should be rendered aseptic by previous prolonged boiling. The douches should be thrown gently, and not harshly and with violence, for fear of penetrating the Eustachian tube or larynx and even contributing to the spread of the inflammation. The lavages are only useful in removing the products of abnormal secretion, which contaminate the mucosa. They should be made with considerable slowness, so that the liquid may easily penetrate all the folds and sinuosities; the pressure should be just sufficient to overcome the resistance due to the friction of the liquid against the walls of the nasal fossæ; an almost horizontal direction should be given to the jet.

The antiseptic or disinfectant solutions which are ordinarily employed are: phenic acid (1 to 5 per 1000), permanganate of potash (1 per 10000), boric acid (1 to 3 per 100).

The powders used are boric acid, iodoform, aceto-tartrate of aluminum, and nitrate of silver. The latter should be mixed with starch in variable proportion (½ to 10 per 100). Tannin and many other antiseptics may be employed in powder form.

The caustics are applied to the diseased points by means of a silver probe. Such are chloride of zinc, chromic acid, and nitrate of silver. The galvano-caustic is also employed.

The air-douche, applied by means of a Politzer air-bag, is chiefly employed in affections of the naso-pharynx, Eustachian tube, and middle ear.

In the chronic affections of the naso-pharynx, and in ozæna, we often have recourse to painting with iodized glycerin, the formula of which is as follows:

Iodine	2.5 to 5.0
Iodide of potassium	30.0
Glycerin	250.0

Lastly, among the antiseptics employed less frequently we may mention chloroform, employed to kill the parasites of the nasal fossæ, lime-water (in nasal diphtheria), ichthyol (in acute coryza), iodide of potassium (in nasal syphilis), menthol (as an anæsthetic of the mucosa), papayotin (in local diphtheria), resorcin (in ozæna), and thymol (in solution for irrigation), etc.

ANTISEPTIC TREATMENT OF DISEASES OF THE EARS.

The cleansing of the external auditory passages ought always to precede every intervention, medical or surgical, and even every exploration for diagnosis. For this purpose, warm boiled water and a rubber hand-ball syringe are necessary. Solutions of boric

or salicylic acid may be required; and if there exist a fetid otorrhœa, phenic acid or corrosive sublimate will fulfill the indication. A solution of sulphate of soda (5:100) opposes the coagulation of the secretions. Injections should always be made under feeble pressure to avoid the vertiginous attacks that follow compression of the tympanum. A probe with a little absorbent cotton wrapped around the end completes the cleansing and serves to dry the auditory canal. If there are concretions adherent to the walls, a solution of bicarbonate of soda (1 to 2 per cent.) facilitates their softening.

The air-douche applied by the aid of the Politzer air-bag is both a device of diagnosis and a means of treatment. By mediate auscultation it enables us to determine the degree of permeability of the tube, and to know if the air penetrates the middle ear. Besides, this douche clears away the liquid effused into the tympanum, which may flow out by the tube or by the opening of the tympanum, provided the membrane be perforated. From a more general point of view it has a real antiseptic rôle, by drying the secretions and favoring the regression of the local hyperæmias. It may also serve to convey into the middle ear certain medicinal vapors (vapor of water and of hydrochorate of ammonia—little employed to-day).

To insufflate into the tympanum the vapors of iodide of ethyl, of menthol, of chloroform, of ether,

of turpentine, aural surgeons make use of a special apparatus called the *insufflation capsule.*

Medicinal liquids may be carried up to the tympanum by the aid of the Eustachian catheter to which is adapted a Pravaz syringe or a small rubber hand-ball. By a full insufflation the liquid is injected into the middle ear. In cases of perforation of the tympanum, we inject by the tube a liquid which washes away the secretions accumulated in the cavity, and which flow out by way of the external auditory meatus.

The insufflation of powders is employed in treatment of suppurations of the middle ear. Boric acid and alum finely pulverized, calomel, salol, etc., have been successively used.

Solutions of corrosive sublimate (1:10000) and of nitrate of silver serve also in the treatment of suppuration of the middle ear. Recently, camphorated salol has been proposed by M. Pegon under the form of a pasty liquid with this composition:

Salol..... 2 parts.
Camphor..... 3 parts.

A little absorbent cotton is soaked in this mixture, and passed by means of a probe to the bottom of the ear (as near as possible to the diseased point), and the application may be renewed two or three times a day. Each application is preceded by a boric acid injection.

Tetra-borate of soda was introduced into therapeutics by Jaënicke; it is a well defined product, more

antiseptic than boric acid, and quite soluble in cold and very soluble in warm water. Both acute and chronic otorrhœa have been treated with success by means of this new antiseptic (Kafemann).

Sulphate of zinc, perchloride of iron, sulphate of copper, etc., have been employed in affections of the middle ear. Alum in powder or concurrently with solution of nitrate of silver renders service in the same circumstances, while iodoform does not give good results. The latter may, however, be advantageously employed, either alone or in conjunction with the phenic solutions, for the dressing of abscesses of the mastoid process after puncture and evacuation of the pus. These abscesses should be opened and treated conformably to the rules of surgical antisepsis, like any other abscess situated in a bony region communicating with the exterior. A dressing of iodoform gauze may be used with advantage in such cases.

CHAPTER X.

ANTISEPSIS IN ACCOUCHEMENTS AND IN GYNÆCOLOGY.

One of the principal antiseptics employed in gynæcology is boric acid in saturated solution (4:100). Boric acid is a feeble antiseptic, but very useful for large injections on account of its absolute innocuousness, and serves for intra-uterine as well as vaginal injections. It should be dissolved in boiled (*i.e.*, sterilized) water. Borated vaselin (4:100) is the favorite antiseptic ointment of obstetricians.

Phenic acid has long been employed. Strong solutions are only to be used when a caustic action is desired. A 2-per-cent. solution is suitable for cleansing wounds and as a lotion for cutaneous diseases. Phenic acid, being but little soluble in water, is generally dissolved by the help of alcohol or glycerin. The essence of thyme masks its odor. In obstetric practice one drachm of the concentrated phenic acid may be mixed with a drachm of glycerin and dissolved in a pint of hot water; this solution suffices for vaginal and even intra-uterine injections, but it should be allowed to flow freely out again after being injected. The concentrated phenic acid should contain just enough alcohol to keep it liquid, *i.e.*, about 10 per cent.

Salicylic acid (1 to 2 : 100) is but little employed in gynæcology.

Alum is a feeble antiseptic; a common astringent vaginal injection is made by dissolving a heaping teaspoonful in a pint of water.

Nitrate of silver is employed chiefly to cauterize the tissues. The solid stick brushed over diseased surfaces was formerly a favorite application in cervical endometritis and erosions of the os. It has largely gone out of use. As a preventive treatment of the purulent ophthalmia of new-born babies it is employed according to Credé's method: at the moment of birth a few drops of a 2-per-cent. solution are instilled between the eyelids. The black stain which it leaves on the skin and the linen makes it extremely objectionable, in ordinary practice, for the antiseptic treatment of the genital organs.

Chloral in solution (1 to 2 : 100) is too irritant for general use. Has been prescribed for pruritus vulvæ.

Liquid chloride of lime (1:10) is chiefly employed for the disinfection of chamber-vessels and water-closets. Chloride-of-zinc solution (1:100) may be substituted for it.

Creolin in solution (1 to 2 : 100) is little toxic, and does not corrode instruments. A 3-per-cent. solution is said to have an antiseptic power equal to that of corrosive sublimate 1:1000.

Creasote has the property of coagulating albumen and of exercising a caustic action to a certain depth.

It is useful after curetting, as a mildly caustic application to the uterine mucosa.

Creasote may be employed pure or in solution with alcohol and glycerin. A strong solution consists of equal parts of these substances. A weaker solution, much in use, contains one part of creasote and one of alcohol to eight of glycerin.

Iodoform is an excellent antiseptic, and almost indispensable in all the operations of gynæcology. Its favorable action on suppuration and ulcerations is manifest, and assures for it an incontestable superiority over all the other dry antiseptics. A good vaginal suppository is made as follows:

Iodoform	1.0
Glycerin	8.0
Cacao butter	q. s.

For one suppository. To be introduced into the vagina or uterus after accouchement.

Iodoform gauze and iodoform cotton are in daily use in gynæcology, despite the unpleasant odor thereby imparted to hands, instruments, and garments.

Iodoform-glycerin (1 part iodoform to 4 of glycerin) is useful for soaking vaginal tampons to modify ulcerations or erosions of the os uteri.

Iodoform is also employed in powder for a dressing for wounds, being applied by a powder-blower or dusted over the parts.

Iodol is void of odor, and may be substituted for iodoform in ordinary practice, being less likely to

produce toxic accidents, though possessing a feebler antiseptic power.

Iodine, under the form of tincture of iodine, is employed as a caustic for painting the cervix uteri.

Ichthyol (sulpho-ichthyolate of ammonia) pure, or in solution in glycerin, is employed for the same purposes. By its siccative action it modifies advantageously the uterine and vaginal secretions, and it enters into the composition of many topical remedies.

Corrosive sublimate is very much employed in watery solutions. Van Swieten's solution is 1 per 1000. The formula is as follows:

Bichloride of mercury	1.0
Alcohol	100.0
Water	900.0

For ordinary injections the saline solution may be used:

Bichloride of mercury	1.0
Chloride of sodium	5.0
Water	1000.0

This solution, made with sterilized water, should be diluted with an equal quantity of boiled water for vaginal injections, and for irrigations during operations. The sublimate tablets, each containing ½ gramme (7½ grains), are very convenient for obstetric practice. One of these dissolved in a pint of water makes the 1:1000 solution. Surgical instruments should not be kept in the sublimate solutions during

operations, but in a boiled carbolic solution, which will not tarnish them.

Naphthol β may be employed in solution of 1 per 1000 when poisoning by corrosive sublimate or carbolic acid is feared. One gramme of naphthol β may be dissolved in 50 of alcohol and 950 of water for ordinary use.

Permanganate of potash in solution is a good antiseptic which has no disadvantage except that it stains the skin and the linen red. Fifteen grains (1 gramme) to the pint makes the strong solution, 15 grains to the quart the weak solution. [The latter is a good antiseptic in obstetrical practice.]

Salol in powder or in the form of crayon is employed in the treatment of ulcerations and in endometritis.

Sulphate of copper in 1: 1000 solution is of feeble toxicity, and may be employed in vaginal or uterine injections when corrosive sublimate is contra-indicated. Sulphate of zinc, less active, is often prescribed in leucorrhœa of blennorrhagic origin, or in simple leucorrhœa.

Thymol is of too high a price to enter into ordinary practice.

Microcidine (a compound of naphthol β and soda) is very soluble and little toxic. It is used in obstetric practice for vaginal and uterine injections before and after accouchement, in 4: 1000 solution.

Obstetrical Antisepsis. —The obstetrician of

to-day hardly needs enlightenment as to all the preliminary precautions in the way of personal cleanliness and antisepsis necessary before he attempts the care of a puerperal woman. The same care is obligatory on the nurses and other attendants. When an obstetrical operation is to be performed, the most rigid antisepsis of hands and instruments is demanded.

The physician in charge of the lying-in woman should keep his finger-nails cut short and scraped; they should be scrubbed with the nail-brush and soap-suds. The sleeves must then be rolled up and fastened above the elbows, and the hands and forearms scrubbed with hot soap-suds, and the hands dipped in a 1:500 sublimate solution; then, when examinations are to be made, the fingers and the back of the hand should be greased with boric vaselin. These are precautions which are regarded as indispensable by such distinguished obstetricians as Auvard and Tarnier, and, in fact, by all the best authorities all over the world.

The sublimate solutions should always be extemporized at the moment, and for this purpose the little tablets prepared by Parke, Davis & Co., Fraser, Killgore, and others, and which generally contain a little tartaric acid to favor solution, and a little coloring material, are very convenient. Fifteen of the one-grain tablets to a quart of filtered or boiled water makes the 1:1000 solution.

INSTRUMENTS.—The instruments should be kept

just prior to and during the operation (when not needed) in a boiled carbolic solution. They should always be sterilized before use by immersing them ten minutes in boiling water. After being used they should be plunged into cold water, which, by preventing the coagulation of albumen, renders them more easily cleaned.

Some, for greater precaution, pass their instruments through the flame of an alcohol lamp or sterilize them by the heat of the dry stove, before using. As far as possible, surgical instruments should be entirely of metal, as the horn or wood of the handles alters by heat and contact with water and presents less security than the metallic handle.

Most authorities regard the dry-heat stove as the best means of sterilization. The heat should not exceed 150° C. (300° F.), otherwise the temper of the instruments will be destroyed. The sojourn in the dry-heat stove should be half an hour. Instruments not metallic can be sterilized in a 1: 1000 sublimate solution. Gauze (simple or iodoform) and absorbent cotton are kept in aseptic boxes hermetically closed. Sponges should undergo a quite special preparation, and then be kept in perfectly tight glass vases.

Simple Accouchement.—Preventive antisepsis during the last few weeks of pregnancy is a good precaution. It is absolutely indispensable if there are hæmorrhages or other discharges during gestation, whatever may be their cause; it is a fact of

common observation that post-partum accidents are more common in women who have had leucorrhœal and other discharges during pregnancy.

During the last fortnight, then, the physician will see that the vulva is occasionally washed with soap and water, and that a vaginal injection of corrosive sublimate, 1:4000, is made. For these injections, a fountain syringe with hard rubber or celluloid cannula is desirable; this should hold at least two quarts, and when used is suspended on the wall a few feet above the bed, so that the liquid may flow through the long rubber tubing by the force of gravity. A suitable tube-nipper will arrest the flow when desired.

At the moment of accouchement the nurse will bathe the external genitals with soap and water and make an antiseptic sublimate injection.

Whenever the accoucheur makes a vaginal examination he will take the same antiseptic precautions as before indicated, and will grease the finger with borated vaselin. He will make as few examinations as possible. When the head appears at the vulvar orifice, he will have at hand a sublimate solution 1:2000, and wads of absorbent cotton dipped in this solution, with which he will from time to time wipe the external genitals. If there be expulsion of fæcal matters, these are at once removed and the parts antiseptically cleansed. All the genital region, within and without, may be greased with the borated vaselin; this may facilitate the escape

of the fœtus and protect the skin of the region. A careful cleansing of the vulva will follow the delivery.

When the antisepsis has been well carried out during pregnancy and accouchement, the injections (even vaginal) will often be unnecessary after confinement. All that need be done is to keep antiseptic pads (wrung out in sublimate solution and dried) over the external genitals. Iodoform or corrosive-sublimate gauze will answer the purpose. If vaginal injections are indicated on account of the lochia becoming offensive, they may be made with the 1-per-cent. carbolic solution.

Application of Forceps; Version; and Other Operations.—All the operations necessitating the introduction of the hand or instruments into the uterus demand an antisepsis much more strict than does simple accouchement.

The woman being placed in the proper position, and rendered aseptic by the lavages and injections above indicated, the forceps are passed through the flame, then plunged into boiling water and greased with vaselin. When they are removed, after delivery, they are at once placed in cold water before being cleansed.

It is a good plan, after an application of the forceps, especially at the superior strait, to follow delivery by an intra-uterine injection of carbolic solution, 1:100.

In case of version, the hand and forearm to the

elbow must be rendered aseptic, then greased with borated vaselin.

Lastly, when all is completed, there should be an antiseptic lavage of the vulva, vagina, and uterine cavity.

Tarnier, in one of his recent obstetrical lectures, has shown the brilliant results which have followed antiseptic midwifery: "Eight years ago [in the Maternity], out of 1340 lying-in women there were 33 deaths (a mortality of 2.50 per 100); to-day, with more rigid antiseptic care, the mortality has fallen to 1.04 per 100."

[Much more startling statistics could be furnished, if it were deemed necessary to compare present practice with the old-time practice. In fact, in all our leading lying-in hospitals, puerperal fever, once such a scourge, is nearly exterminated.]

Tarnier employs in his "Maternity" corrosive sublimate (1:5000); sulphate of copper (5:1000); permanganate of potash (½ gramme per 1000); phenic acid (20:1000); and lastly, microcidine (4:1000). He prefers the latter as the best known antiseptic after corrosive sublimate.

ANTISEPSIS IN OPERATIVE GYNÆCOLOGY.

The antiseptic precautions which concern the operator, his assistants, and his instruments, are the same as in instrumental obstetrics, and need not here be repeated.

Digital exploration should not be made until after washing of the vulva and vagina and an antiseptic injection. The exploring finger should be first well disinfected, and greased with boric vaselin.

The speculum should be rendered thoroughly aseptic, and plunged in cold water immediately after being used. Then it should be cleansed, wiped with a dry cloth, and immersed for a time in a strong phenic solution. In cases of vaginitis or of any venereal affection, it will be well, besides the other antiseptic precautions, to pass the speculum through the alcohol-flame.

The uterine sound and all the other instruments should be also rendered aseptic. These instruments should never be introduced into the uterus without an antiseptic vaginal irrigation, made with care, the speculum being in place in order that the injection may penetrate all the folds of the mucosa.

Dilatation of the cervix is made by means of prepared sponges or sea-tangle tents. These laminaria tents should be rendered aseptie by soaking them four days in a saturated solution of iodoform-ether, from which they are not removed until they are needed. Their application should be made with the same precautions as in the introduction of the uterine sound.

Vaginal and Uterine Topical Agents.—These are tampons, suppositories, ovules, crayons, strips of gauze, etc. Tampons are very much used in gynæcology, and are made of little rolls of absorbent cot-

ton or antiseptic wool, moulded to fit the vagina, and tied, kite-tail fashion, with an aseptic string, and soaked in glycerin or any other medicated liquid. The string hangs outside the vulva, and enables the woman to withdraw the tampon after from twelve to twenty-four hours.

Suppositories have over tampons the advantage of melting slowly without leaving any other residue than that which can be removed by an injection. The following is a favorite with M. Auvard; it is employed in the sequelæ of accouchements with menace of septic accidents:

Iodoform	1.0
Glycerin	8.0
Cacao butter	q. s.

M. For one suppository. (This may also be useful in gynæcology.)

Ovules are destined to replace tampons and suppositories. They are made in moulds by the aid of glycerin jelly, and their forms are very varied. They are introduced by the patient, and generally kept in all night, *i.e.*, between two injections. They produce quite an abundant discharge. These ovules may be medicated with boric acid, tannin, iodoform, chloride of zinc, resorcin, salol, ichthyol, aristol, etc.

This kind of dressing exercises its action not only on the vagina, but on the uterus and its annexes.

Crayons, of harder consistence than the ovules, and of another form, serve to introduce the antiseptics

into the cavity of the cervix and of the uterus. Various antiseptics may be incorporated in them, as iodoform, ichthyol, camphorated salol, chloride of zinc.

Gynæcologists also introduce liquid caustics, as nitric acid, into the cavity of the uterus, notably in endometritis, in order to cauterize the mucosa and produce by a chemical process an eschar which replaces mechanical curettage.

Antiseptic gauze (iodoform, corrosive sublimate) is also employed to tamponade the vagina, and even the uterus, in *post-partum* hæmorrhages, and in gynæcology after curetting. It acts as an antiseptic and as an obturating and protective tampon.

Curettage of the Uterus.—This operation, which necessitates taking chloroform and bringing down the uterus to the vulvar orifice, is of very frequent performance in gynæcology.

The cervix is first dilated with iodoform laminaria tents, or the steel dilator of Ellinger or Sims. All instruments must be thoroughly aseptic, and vulva, vagina, and cervix must before and during the operation be irrigated with sublimate solution (1:2000 or 1:4000).

After curetting is completed, the uterus is swabbed out with a solution of creasote and glycerin (one part creasote to five parts of glycerin). A platinum uterine probang serves for this purpose. Then a final lavage of the uterus and vagina is made with a stronger sublimate solution (1:1000). A strip of

iodoform gauze impregnated with glycerin is then carried up to the fundus uteri, and the extremity allowed to hang out of the vagina. An iodoform tampon is then placed in the vagina through the speculum, and left there for three days; at least, it is not removed until it is soaked with the discharge. Iodoform is, thus far, the best antiseptic in our possession for shielding the parts from the septic influence of these discharges and for staying the production of pus in general. For this purpose, despite its disagreeable odor, it is still to be preferred in gynæcological operations.

PART III.

*ANTISEPTIC HYGIENE OF PATIENTS AND THEIR ENVIRONMENT.**

BODILY HYGIENE OF THE PATIENT.

Cleanliness of the body, obtained by frequent ablutions with pure water, is the most important of all hygienic requirements. Asepsis must precede antisepsis, for in many cases it precludes the necessity of the latter. In sickness, cleanliness becomes even more necessary, both for the patient, who is a subject of auto-infection, and for his attendants, who are exposed to the contagion.

As sick persons are seldom in a condition to carry out the necessary hygienic requirements for themselves, it is the more important that the medical attendant should obligate on others duties, even the most elementary, which pertain to the cleanliness as well as the proper aëration and disinfection of the sick. The preoccupation of the disease, and the mental and physical prostration, generally render the patient indifferent to all that does not immediately concern his sufferings; and it is undeniable that families and people at large do not yet understand the importance of frequent ablutions and changes of

*I have taken some liberties with this chapter, especially in the way of abridgement.—TRANSLATOR.

under-apparel, of bed-clothes, etc., for the sick. Many a feverish patient who should have an abundance of fresh air and be lightly covered with bed-clothes, is found on the doctor's arrival to be smothered with blankets and kept in a room from which all pure air is rigorously excluded by keeping the doors and windows shut.

It is the physician's duty to enlighten the public as to the importance of correct hygiene for the sick as for the well, and he will not consider even the minor details of bodily hygiene as of little moment, for they may count for considerable in the final result.

The physician, then, cannot too much insist on the necessity of daily ablutions—once or twice—performed in a way not to unduly fatigue the patient. Even in eruptive fevers such ablutions are necessary, and they should be made with tepid water. The hair should be well combed, and on certain occasions (fevers, meningeal affections) cut short. The beard should be well trimmed. The bed-clothing and underwear should be frequently renewed. This is especially urgent in dysentery and typhoid fever.

The air of the room should be continually renewed, and when the season of the year will permit, the windows should be kept open, for oxygen is the best of antiseptics. The temperature of the room should not be too high nor too low; for most occasions a temperature of 65° F. (18° C.) is sufficient. A

stove in a sick-room is bad; an open fire-place is far preferable.

Hygiene of the Mouth.—The cleansing of the mouth, always important, should be done oftener and more thoroughly in sickness than in health.

In a great many affections, relapses or complications are attributable to the microbes which the patients have conserved in their mouths, a culture field eminently favorable to their multiplication. This is particularly true of the pneumococcus, or microbe of pneumonia; pneumococcus angina frequently succeeds a frank pneumonia. The dental caries which follows grave fevers, particularly typhoid fever, is only a consequence of neglect of the mouth and teeth. In anginas of all kinds, gargles and irrigations are obligatory, and the mouth should be well rinsed and scrubbed; in fact, mouth-rinsing after each meal was a custom of our fathers which it would be hygienic for the present generation to continue. English ladies have the habit of cleansing the mouth before going to bed, and certainly the custom is worthy of general adoption. This mouth-washing not only removes débris of food which lodges between the teeth and menaces their soundness, besides getting up a fermentation under the influence of the saliva, but it also renders the mouth less likely to be a culture field for microbes which only await a suitable occasion to become pathogenic. Dujardin-Beaumetz recommends the following mouth-wash:

Phenic acid	1.0 Gm.
Boric acid	25.0
Thymol	0.50
Essence of peppermint	20 drops.
Tincture of anise	10.0 Gm.
Water	1 litre.

Rinse the mouth and scrub the teeth with water containing an equal quantity of this solution: do this after each meal. Brushes that are soft are to be preerred. I cannot approve of the ordinary dentifrice powders; a toilet napkin soaked in the antiseptic liquid will always suffice. Hard brushes irritate the gums and make them bleed; dentifrices are likely to wear away the enamel, and make a way of entrance for the microbes of dental caries.

Thomas has made a special study of antiseptic dentifrices, and prefers thymic acid, 1 per 2500. His formula is as follows:

Thymic acid	0.25
Benzoic acid	3.00
Tincture eucalyptus	15 00
Alcohol	100.00
Essence peppermint	0.75

A feeble antiseptic for rinsing the mouth. The following contains corrosive sublimate, and is stronger:

Thymic acid	0.15
Corrosive sublimate	0.80
Benzoic acid	3.00
Tiucture eucalyptus	15.00
Alcohol	100.00
Essence peppermint	0.75

A few drops of these solutions in a half-tumbler of water suffice for the mouth-wash. The tooth-brush when not in use must be kept in an antiseptic liquid.

One of the best and oldest of formulæ for the prevention of dental caries is the *Eau de Botot:*

	Parts.
Anise seeds	64
Canella	16
Cloves	1
Pyrethrum	4
Cochineal	5
Cream of tartar	5
Benzoin, Myrrh, ää	2
Essence of peppermint	4
Alcohol	2000

Rub up the solid ingredients into a fine powder, add the alcohol, and macerate eight days.

A teaspoonful to a glass of water makes the dentifrice solution. The habitual use of this solution prevents decay of the teeth, and often averts the fluxions and consequent toothache so frequent in persons who have carious teeth.

For antisepsis of the digestive tube, employ salicylate of bismuth, salol, naphthol, benzonaphthol, conformably to the rules before laid down.

HYGIENE OF NURSES AND OTHER ATTENDANTS ON THE SICK.

Nurses and others that have the care of the sick should take all the precautions which belong to gen-

eral hygiene, and, when called to accouchements or to assist in gynæcological or surgical operations, should make all the antiseptic preparations and rigorously carry out the rules which I have indicated under the head of Antisepsis in Obstetrics and Gynæcology.

They ought to wear special garments appropriate for the services which they render the patient; these should be laid aside when they quit the sick-room. Nurses must take sufficient rest, sleep, recreation, and nourishment to keep them in their best efficiency. In no case may they eat their meals in the sick-room. I would say to such persons: "Wash your hands whenever you touch the sick person or his dejections; use a solution of sublimate or thymol, 1 per 1000. Cleanse and scrape the nails often; wash frequently the face, hair, and beard, and take a full bath every day. Every day take a hygienic walk of a mile or so in the open air."

The physician will see to it that the patient is not exposed to danger by visitors who have not taken any pains to disinfect themselves. This remark is especially applicable to obstetric attendance. The germ of puerperal septicæmia may be brought by a person unconscious of the danger which his or her presence entails on the lying-in woman. A physician, in a recent medical journal, relates an instance where, after having taken the most minute antiseptic precautions such as are now-a-days always recommended in such cases, he was shocked to see his

patient attacked with puerperal fever a few days after her confinement. On inquiry, he found that the mother of the lying-in woman had, a few days before, passed several hours in the room of another woman who had died of puerperal fever, and had even assisted in laying out the body. Persons affected with cancer, with chronic suppuration, etc., should not be allowed to enter the room of the sick person.

The isolation of the patient, so desirable for himself as well as for persons who are well, is possible at hospitals, but can only be carried out imperfectly in private practice. The most that the physician often can do is to forbid persons who come only from curiosity, and particularly young children, who are predisposed to contract contagious diseases, to enter the sick-room.

Cleanliness of the hands is one of the most necessary conditions for the prevention of contagion by persons who handle the sick. Beside the lotions previously indicated, the sulphur soaps, carbolic soaps, etc., the following Aromatic Lotion may render service:

Carbolic acid.....	1 part.
Alcohol.....	4 parts.
Distilled water.....	100 parts.

Antisepsis of the Sputa.—Especial attention should be given to the disinfection and disposal of sputa, especially of the sputa of phthisical patients. The patients should be forbidden to spit in a handker-

chief. If this cannot be prevented, all infected handkerchiefs or cloths should be immediately burned. The only way to render them safe for future use is to boil them in water or in some antiseptic solution. The patient should not be allowed to expectorate on paper. The paper, generally a piece of newspaper, easily tears between the fingers of the patient, who then wipes them on a towel or even on the bed, clothes. The only spittoon to be recommended is one of porcelain or crockery, furnished with a movable cover; this should be half-filled with a solution of corrosive sublimate 1 or 2 per 1000, and should be emptied and cleansed at least twice in the twenty-four hours. The contents of the spittoon having been emptied into sawdust and immediately burned, the spittoon should be washed with a sublimate solution, or at least well scalded out with water. Only dried sputa are dangerous. The point of caution should therefore be to destroy the moist sputa before the process of evaporation has time to liberate the germs to be carried about in the form of dust.

Antisepsis of the Skin in Exanthematous Fevers.— To prevent the dissemination of epidermic scales dried and reduced to powder in eruptive fevers, it is a good plan to grease the skin with borated or sublimate vaselin. This precaution prevents the patient from inoculating himself by scratching, and in many cases it aborts the papules or prevents them from suppurating. Besides, it prevents contagion by the dried scales during desquamation.

A child that has had any eruptive fever (measles, scarlatina, smallpox), during the period of convalescence and for some time after recovery should take a soap and-water bath every day. These baths should be preceded by thorough rubbing of the hairy scalp with sweet oil or borated vaselin so as to detach all the epidermic scales. The child will not be in a condition to send to school till twenty-five days after the onset of the disease, in case of measles, and forty days in case of scarlatina or smallpox.

Antisepsis and Disinfection of the Dejections.— All chamber vessels and water-closets should be kept clean and disinfected with antiseptic solutions, among which there is nothing better than the solution of sulphate of copper, 5 per 100. This solution is very much cheaper than carbolic acid, and is free from odor.

ANTISEPSIS AND DISINFECTION OF HOUSES.

When you have to do with contagious diseases, the disinfection of the bedding and clothing of the patient and of the sick-room should be done with the greatest care when the disease is ended.

It is well at the onset of any long or dangerous disease that the curtains and carpets should be removed, and in fact everything that can intercept germs or hinder the free circulation of air.

The bedding and every article of clothing that has been contaminated by the dejections of the pa-

tient should be disinfected and cleansed. This disinfection should be made in the hot-air stoves in which steam is made to act under high pressure. The movable hot-air stoves are useful where there are no establishments for dry-heat disinfection open to the public, such as we have in Paris.

The disinfection of the sick-room may be effected in different ways: by chlorine, by sulphur fumigations, and by corrosive sublimate. The latter tends more and more to replace the other agents of disinfection, being less offensive than sulphur or chlorine, and being little expensive. Thus, where disinfection, to be complete, demands 5 kilogrammes of phenic acid, it may be accomplished quite as effectually with one kilogramme of sulphate of copper or 25 grammes of bichloride of mercury.

The solution of corrosive sublimate 1 per 1000 is much in use in the disinfection of apartments by the squads of disinfectors organized for the city of Paris, who are placed gratuitously at the disposal of the public. Wall papers and hangings, even the wood of the floors, are impregnated with this solution, which penetrates all the chinks, and every part is brushed and rubbed with care. Water-closets, bath-tubs, sinks, etc., are also disinfected. I have seen apartments recently treated by this method, and can vouch for the ease with which it can be accomplished and the safety which it confers.

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